Vibrational Spectroscopic Database on Acetylene, $\tilde{X}\,^1\Sigma_g^+$ ($^{12}C_2H_2$, $^{12}C_2D_2$, and $^{13}C_2H_2$)

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Information on the vibrational energy states in acetylene ($^{12}C_2H_2$, $^{12}C_2D_2$, and $^{13}C_2H_2$) is gathered: spectroscopic constants (vibrational frequencies and anharmonicities, vibration-rotation interaction parameters), observed vibrational energy states and *complete* sets of predicted vibrational energies and predicted principal rotational constants B_v for states of $^{12}C_2H_2$, $^{12}C_2D_2$, and $^{13}C_2H_2$ up to 15000, 10000, and 12000 cm^{-1}, respectively. Statistical parameters (partition functions and integrated number of states) deduced from these predicted spectroscopic data are provided for the three isotopomers. The equilibrium geometrical structure is determined to be $r_e(CH) = 106.138(35)$ pm and $r_e(CC) = 120.292(13)$ pm from constants available for $^{12}C_2H_2$, $^{12}C_2D_2$, $^{13}C_2H_2$, and $^{12}C_2HD$. © *2003 American Institute of Physics.* [DOI: 10.1063/1.1531651]

Key words: acetylene; $^{12}C_2H_2$, $^{12}C_2D_2$, and $^{13}C_2H_2$; energy of the vibrational states; geometrical structure; partition functions; principal rotational constants of the vibrational states; vibrational frequencies and anharmonicities; vibration–rotation interaction parameters; vibrational level density.

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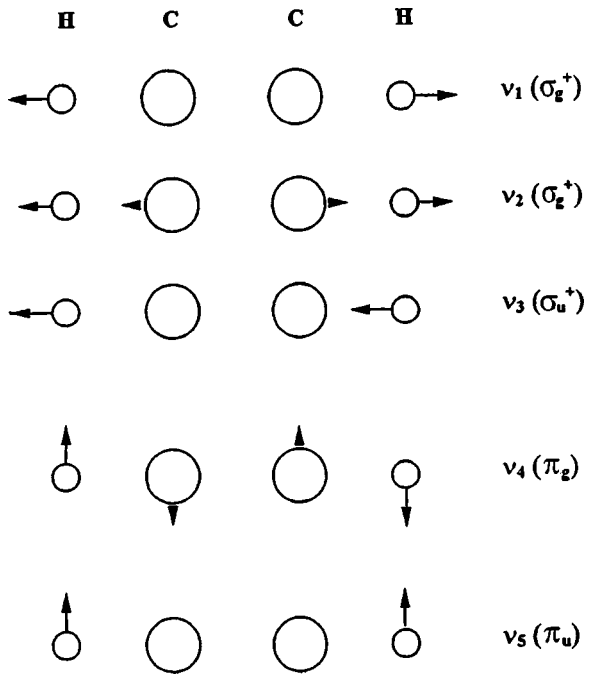

FIG. 1. Normal modes of vibration in acetylene, $^{12}C_2H_2$ (adapted from Herman *et al.*[1]).

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1. Introduction

Acetylene, C_2H_2, also named ethyne and pictured in Fig. 1, is the prototype carbon–carbon triple bond species in chemistry. Thanks to its vibration–rotation absorption spectrum in the infrared range, it is observed in a number of outer environments and the Earth's atmosphere. The vibration–rotation spectrum of acetylene was extensively investigated from the far infrared to the visible/ultraviolet range and played a significant role in the prototypical investigation of intramolecular processes. Interest in spectroscopic data on acetylene in the ground electronic state is demonstrated by the abundant related literature, as gathered, up to 1998 in annex 1 of Herman *et al.*[1] This annex provides the full reference of all papers mentioned, including their title. For completeness, one should mention that the vibration–rotation lines from the absorption spectrum of acetylene, $\tilde{X}\,^1\Sigma_g^+$, are currently used both as energy standards, to calibrate spectral energy scales, and as absorption intensity standards, to retrieve concentration and calibrate instrumental detection sensitivity. These areas are, however, not considered in this paper, because they are still significantly evolving in the literature, with an expected increasing emphasis in the near future.

This prototypical role played by acetylene in a number of research areas motivates the present spectroscopic database. Among the relevant information of interest to an increasingly larger community are the prediction of the energy G_v and principal rotational constants B_v of the vibrational states up to high excitation energy. This is not a trivial task, by any means, given the extent of anharmonic resonances affecting the vibrational energy pattern in this molecule. As a result of recent studies on $^{12}C_2H_2$, $^{12}C_2D_2$, and $^{13}C_2H_2$ performed in various laboratories, a theoretical model was developed in the literature, which nowadays allows the many observations to be precisely reproduced and therefore reliable predictions to be made. The major goal of this paper is to make the list of predicted vibrational energies and principal rotational constants available to the scientific community (as given in Secs. 9–11). These predictions are used to calculate statistical properties, namely the integrated number of states, in Sec. 8, and partition functions at various temperatures in Sec. 7. All *experimental* vibrational energy states reported in the literature are listed for the three isotopomers considered in Secs. 4–6. We gather, in Sec. 3, vibrational frequencies and anharmonicities, as well as other constants and labels relevant to the predictions listed in the final sections. The ground state principal rotational constants and moments of inertia of $^{12}C_2H_2$, $^{12}C_2D_2$, $^{13}C_2H_2$, and $^{12}C_2HD$, and their vibrational dependence, are provided in Sec. 2, allowing the geometrical structure of acetylene to be updated in that section.

2. Geometrical Structure

High resolution infrared and Raman spectroscopy (Edwards,[2] Herman and Colin,[3] Kostyk and Welsh,[4,5] Baldacci *et al.*,[6] Fast and Welsh,[7] Graner,[8] Plyler *et al.*,[9] Lafferty

TABLE 1. Principal rotational constants (B), moments of inertia (I), and vibration–rotation constants (α) for acetylene, $\tilde{X}\,^1\Sigma_{(g)}^+$

Constant	$^{12}C_2H_2$	$^{13}C_2H_2$	$^{12}C_2D_2$	$^{12}C_2HD$
α_1 (10^{-3} cm^{-1})	6.904 3[a] (11)	6.124 49[d] (64)	5.585[g] (71)	4.830[g] (46)
α_2 (10^{-3} cm^{-1})	6.181 2[b] (13)	5.808 37[d] (17)	3.133[g] (71)	4.300[g] (46)
α_3 (10^{-3} cm^{-1})	5.881 8[c] (11)	5.311 9[e] (64)	4.495 0[h] (90)	6.646[j] (34)
α_4 (10^{-3} cm^{-1})	−1.353 535[b] (86)	−1.027 82[f] (10)	−2.081 27[i] (14)	−2.541[j] (39)
α_5 (10^{-3} cm^{-1})	−2.232 075[b] (40)	−1.933 186[f] (43)	−2.158 84[i] (17)	−1.459[j] (47)
B_0 (cm^{-1})	1.176 646 32[b] (18)	1.119 574 687[f] (146)	0.847 874 20[i] (24)	0.991 527 3[k] (16)
B_e (cm^{-1})	1.182 544 4 (21)	1.125 236 1 (39)	0.850 241 (76)	0.995 415 (151)
I_0 (10^{-40} g cm^2)	23.790 326 4 (36)	25.003 066 2 (33)	33.015 275 1 (93)	28.232 001 (46)
I_e (10^{-40} g cm^2)	23.671 670 (41)	24.877 269 (86)	32.923 4 (29)	28.121 7 (43)

[a]From Table V of Abbouti Temsamani *et al.*[19]
[b]α_2 is calculated from Table 4 and α_4, α_5 and B_0 are from Table 3 of Kabbadj *et al.*[25]
[c]Calculated from Table 5 of Vander Auwera *et al.*[20]
[d]From Table 4 of Di Lonardo *et al.*[21]
[e]Calculated from Table 2 of Alboni *et al.*,[22] with B_0 from Di Lonardo *et al.*[26]
[f]From Table 5 of Di Lonardo *et al.*[26]
[g]From Table 9 of Kostyk and Welsh.[4]
[h]From Table 2 of Ghersetti *et al.*[27]
[i]From Table IV of Huet *et al.*[28]
[j]From Table 9 of Baldacci *et al.*[6]
[k]From McKnight and Gordy.[29]

et al.,[10] Overend,[11] Overend and Thompson,[12] Herzberg *et al.*[13]) together with *ab initio* calculations (Botschwina *et al.*,[14] Martin[15] and Martin *et al.*[16]), and variational studies (Strey and Mills,[17] Carter and Handy[18]) have produced various sets of zero level and equilibrium internuclear distances of acetylene in the $\tilde{X}\,^1\Sigma_g^+$ electronic state. Nowadays, reliable spectroscopic information is available on additional isotopomers and, furthermore, the effect of anharmonic resonances affecting the determination of some of the vibration–rotation constants (actually α_1 and α_3 to be defined in Sec. 3) in $^{12}C_2H_2$ (Abbouti Temsamani and Herman,[19] Vander Auwera *et al.*[20]) and $^{13}C_2H_2$ (Abbouti Temsamani and Herman,[19] Vander Auwera *et al.*,[20] Di Lonardo *et al.*,[21] Alboni *et al.*[22]) can be more precisely accounted for. An improved set of parameters, listed in Table 1, was thus used here to calculate equilibrium internuclear distances. The information on all isotopomers is fitted simultaneously using a least squares procedure, to determine internuclear distances. The calculation is based on most conventional relations, as provided by Herzberg[23] with the atomic masses from Audi *et al.*[24] The two following equations are printed as they define signs and provide a numerical value:

$$B_e = B_0 + \tfrac{1}{2}(\alpha_1 + \alpha_2 + \alpha_3 + 2\alpha_4 + 2\alpha_5), \qquad (1)$$

$$I(\mathrm{g\,cm^2}) = \frac{h}{8\pi^2 c B} = \frac{27.9928\times 10^{-40}}{B}\ (\text{with } B \text{ in cm}^{-1}). \qquad (2)$$

When using this procedure, it is thus assumed that the Born–Oppenheimer approximation holds, i.e., that the internuclear distances are identical for all isotopomers. The new determined internuclear distances, previously unpublished, thus derived from an improved set of constants (as given in Table 1), are, in pm

$$r_e(\mathrm{CH}) = 106.138(35), \quad r_e(\mathrm{CC}) = 120.292(13)$$

$$r_0(\mathrm{CH}) = 105.756(52), \quad r_0(\mathrm{CC}) = 120.830(20)$$

with errors (1σ) in the unit of the last decimal provided, and corresponding to mathematical uncertainty as determined from the fitting procedure, weighted to account for the uncertainty of the moments of inertia as listed in Table 1.

3. Vibrational Constants

The normal coordinates and related nuclear displacements for $^{12}C_2H_2$ are reproduced in Fig. 1, adapted from Herman *et al.*[1] They involve the nondegenerate CH symmetric (ν_1), the CC symmetric (ν_2), and the CH antisymmetric (ν_3) stretching and the doubly degenerate *trans* (ν_4) and *cis* (ν_5) bending. The contribution of the main diagonal vibrational constants to the vibrational energy is defined as follows:

$$G_v = \sum_i \tilde{\omega}_i^0 v_i + \sum_{i\leqslant j} x_{ij} v_i v_j + \sum_{b\leqslant b'} g_{bb'} l_b l_{b'}, \qquad (3)$$

where $i = 1-5$, and $b = 4,5$, with G_v the vibrational energy, $\tilde{\omega}_i^0$ and x_{ij} the harmonic frequencies and first order anharmonicities, respectively, $g_{bb'}$ a contribution of the degenerate

TABLE 2. Main diagonal vibrational constants of $^{12}C_2H_2$ $\tilde{X}\,^1\Sigma_g^+$, in cm^{-1}, deperturbed from anharmonic resonances, as detailed in El Idrissi *et al.*[30] Additional high order constants are provided in the latter reference

$\tilde{\omega}_1^0 = 3397.12$	$x_{11} = -24.81$	$x_{12} = -11.68$	$x_{24} = -12.73$
$\tilde{\omega}_2^0 = 1981.80$	$x_{22} = -7.451$	$x_{13} = -107.50$	$x_{25} = -1.530$
$\tilde{\omega}_3^0 = 3316.86$	$x_{33} = -27.63$	$x_{14} = -13.88$	$x_{34} = -10.02$
$\tilde{\omega}_4^0 = 608.73$	$x_{44} = 3.458$	$x_{15} = -10.52$	$x_{35} = -9.34$
$\tilde{\omega}_5^0 = 729.08$	$x_{55} = -2.374$	$x_{23} = -6.16$	$x_{45} = -2.23$
$g_{44} = 0.497$	$g_{55} = 3.508$	$g_{45} = 6.828$	

TABLE 3. Main diagonal vibrational constants of $^{12}C_2D_2$ $\tilde{X}\,^1\Sigma_g^+$, in cm^{-1}, deperturbed from anharmonic resonances, as detailed in Herman *et al.*[31] Additional high order constants are provided in the latter reference

$\tilde{\omega}_1^0=2717.22$	$x_{11}=-12.30$	$x_{12}=-17.20$	$x_{24}=-3.16$
$\tilde{\omega}_2^0=1768.07$	$x_{22}=-2.69$	$x_{13}=-47.52$	$x_{25}=1.30$
$\tilde{\omega}_3^0=2455.11$	$x_{33}=-15.42$	$x_{14}=-15.49$	$x_{34}=-5.881$
$\tilde{\omega}_4^0=509.237\,901$	$x_{44}=1.8428$	$x_{15}=-8.01$	$x_{35}=-5.37$
$\tilde{\omega}_5^0=537.997\,9$	$x_{55}=-1.6173$	$x_{23}=-13.54$	$x_{45}=-1.6381$
$g_{44}=0.4512$	$g_{55}=2.2670$	$g_{45}=3.182\,3674$	

bending modes (b,b') to the energy, all in cm^{-1}, v_i the vibrational quantum number and l_b the bending vibrational angular momentum, with $l_4+l_5=k$.

Selected sets of reference values for the vibrational constants defined in Eq. (3) are listed in Tables 2–4 for $^{12}C_2H_2$ from El Idrissi *et al.*,[30] $^{12}C_2D_2$ from Herman *et al.*,[31] and $^{13}C_2H_2$ from Di Lonardo *et al.*,[32] respectively. These constants were obtained, for each isotopomer separately, in a simultaneous fit of a large number of experimental observations, i.e., 219 ranging between 0 and 19 000 cm^{-1} for $^{12}C_2H_2$; 88 ranging between 0 and 16 600 cm^{-1} for $^{12}C_2D_2$; and 118 ranging between 0 and 22 000 cm^{-1} for $^{13}C_2H_2$. These sets of constants are complemented in the original references just mentioned with higher order diagonal and off-diagonal terms made indispensable to account for the strong resonance couplings between vibrational states. These additional terms and constants, which would be required to reproduce the state energies and principal rotational constants presented in Secs. 9–11, are not listed here. An alternative, very similar set of constants is available for $^{12}C_2H_2$ from Hoshina *et al.*,[33] arising from a slightly different set of data and an almost identical model. We checked that, when including all significant constants and terms, the two sets available in the literature for $^{12}C_2H_2$ (El Idrissi *et al.*,[30] Hoshina *et al.*[33]) led to very similar vibrational energy and principal rotational constant predictions. A slight improvement for highly excited *cis*-bent states but larger offsets for states above 10 000 cm^{-1} can be expected when using the results from Hoshina *et al.*[33] compared to those of El Idrissi *et al.*[30] The set from El Idrissi *et al.*,[30] with all additional higher order terms not detailed here, is the one used for the predictions listed in Sec. 9, extending up to 15 000 cm^{-1}. One should also mention the existence of additional, more precise sets in the literature, however restricted to pure bending states, in $^{12}C_2H_2$ (Kabbadj *et al.*,[25] Jacobson *et al.*,[34] Hoshina *et al.*[33]), and $^{12}C_2D_2$ (Bermejo *et al.*[35]).

TABLE 4. Main diagonal vibrational constants of $^{13}C_2H_2$ $\tilde{X}\,^1\Sigma_g^+$, in cm^{-1}, deperturbed from anharmonic resonances, as detailed in Di Lonardo *et al.*[32] Additional high order constants are provided in the latter reference

$\tilde{\omega}_1^0=3374.90$	$x_{11}=-25.43$	$x_{12}=-10.55$	$x_{24}=-11.86$
$\tilde{\omega}_2^0=1918.04$	$x_{22}=-7.25$	$x_{13}=-104.26$	$x_{25}=-2.088$
$\tilde{\omega}_3^0=3305.55$	$x_{33}=-26.68$	$x_{14}=-13.52$	$x_{34}=-10.02$
$\tilde{\omega}_4^0=599.92$	$x_{44}=3.084$	$x_{15}=-9.88$	$x_{35}=-8.19$
$\tilde{\omega}_5^0=727.23$	$x_{55}=-2.267$	$x_{23}=-4.84$	$x_{45}=-2.120$
$g_{44}=0.800$	$g_{55}=3.414$	$g_{45}=6.625$	

Due to the extensive anharmonic resonances in acetylene, as further discussed in Herman *et al.*,[1] the states need to be grouped into polyads, named vibrational clusters in some of the literature. The so-called polyad quantum numbers, N_s, N_r, and k are extensively used in some of the remaining sections to label the vibrational energy states. They are defined as follows in $^{12}C_2H_2$ and $^{13}C_2H_2$:

$$N_s=v_1+v_2+v_3,$$
$$N_r=5v_1+3v_2+5v_3+v_4+v_5, \tag{4}$$
$$k=l_4+l_5,$$

and in $^{12}C_2D_2$

$$N_s=v_1+v_2+v_3,$$
$$N_r=v_4+v_5, \tag{5}$$
$$k=l_4+l_5.$$

As confirmed, e.g., by Herman and co-workers[19,30–32,36–44] and Hoshina *et al.*,[33] the polyad model precisely describes the complex spectral features in the acetylene spectra. Crucial information arising from the global fits is the fraction of the conventional $\{v_1,v_2,v_3,v_4^{l_4},v_5^{l_5}\}$ normal mode basis functions that each wavefunction associated with an eigenstate in a $\{N_s,N_r,k\}$ polyad contains. This fraction is the square of the coefficient of the dominant state in the eigenvector expansion. It allows state energies, principal rotational constants, and in some case, relative band intensities to be predicted. The fractions are provided in Secs. 9–11 for each vibrational state, whenever larger than 20%, as determined in El Idrissi *et al.*[30] for $^{12}C_2H_2$, in Herman *et al.*[31] for $^{12}C_2D_2$, and in Di Lonardo *et al.*[32] for $^{13}C_2H_2$.

It must be emphasized again that the spectroscopically unusual $\{N_s,N_r,k\}$ notation is the key to the global model describing the vibrational energy pattern in acetylene and, eventually, to the reliability of the predictions listed in Secs. 9–11. We shall refer to this whole model as the Cluster Model in this paper. It is worth illustrating the notation with an example:

The eigenstate with Σ_u^+ symmetry observed at 10 475.034 cm^{-1} in $^{12}C_2H_2$ (see Table 5) would be labeled $\nu_1+2\nu_2+\nu_4+\nu_5$ (with $l_4=1$, $l_5=-1$, $k=0$) in normal mode conventions, which we actually use to label observed states, in Tables 5–7. Now instead, this state, thus having $v_1=1$, $v_2=2$, $v_3=0$, $v_4=1$, $v_5=1$, and $k=0$, is one of the states of the $\{N_s=v_1+v_2+v_3,N_r=5v_1+3v_2+5v_3+v_4+v_5,k=l_4+l_5,\mathrm{u/g}^{+/-}\}=\{4,16,0,u^+\}$ polyad. Within the polyad model, as detailed in Herman *et al.*[1,30] the corresponding wavefunction is composed as follows, in terms of the $\{v_1,v_2,v_3,v_4^{l_4},v_5^{l_5}\}$ normal basis wavefunctions: 56% arising from $\{1,3,0,1^1,1^{-1}\}$ and 26% from $\{0,4,0,1^1,3^{-1}\}$, the remaining 18% from additional basis states, not detailed. The resulting predicted vibrational energy and principal rotational constant are 10 474.969 and 1.155 63 cm^{-1}, as later

listed in Table 10, to be compared to the observed values 10 475.034 cm^{-1} and 1.155 82 cm^{-1}, as listed in Table 5, from Ding *et al.*[45]

One should note that only the dominant fraction is mentioned in Tables 5–7, provided it is larger than 25%. Another useful comment is to point out that, in some cases, the same basis wavefunction is dominant in the composition of the wavefunction of different eigenstates. In such cases, the label $\{v_1,v_2,v_3,v_4^{l_4},v_5^{l_5}\}$ then appears with identical values of the quantum numbers for more than one eigenstate.

A complete set of predictions, thus considering *all* vibrational states up to 15 000, 10 000, and 12 000 cm^{-1} for $^{12}C_2H_2$, $^{12}C_2D_2$, and $^{13}C_2H_2$, respectively, is provided in the section ''data files'' on the WEB site of the Laboratoire de Chimie Physique Moléculaire at the Université Libre de Bruxelles (http://www.ulb.ac.be/cpm/). A selected set of these predictions is listed in Tables 12–14.

4. Assigned Experimental Vibrational States in $^{12}C_2H_2$

Table 5 gathers the experimental observations concerning vibrational states in $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$. It updates the extensive information provided in El Idrissi *et al.*[30] to include results from recent references. The information in Table 5 is actually restricted to those states that were fully vibrationally assigned and usually fitted using the Cluster Model (El Idrissi *et al.*,[30] Hoshina *et al.*[33]). Thus, only a few states, those specified in footnote of Table 5 labeled ''*'' and those reported in Table I of Jacobson *et al.*,[34] Table I of O'Brien *et al.*,[46] Tables III and IV of Solina *et al.*,[47] and Table V of Jonas *et al.*,[48] that were not fully assigned yet are missing from the present Table 5. The number of decimals printed in the state energies listed in Table 5 is directly related to the precision claimed by the related authors referred to in the last column of Table 5. Most authors do not comment on the accuracy of their spectral measurements and that information is thus not provided here.

It is worth noting that a distinction is to be made between band centers (G_c), as obtained from the analysis of the rotational structure of the bands, and vibrational energies (G_v) for states with $k>0$, which are related by

$$G_v = G_c + B'_v k'^2 + G''_v - B''_v k''^2. \tag{6}$$

The values listed in Table 5 are G_v. One should therefore also point out that experimentally reported hot bands are not listed using the band origin but, rather, using the vibrational energy (G_v) of the upper vibrational state.

The references provided in Table 5 correspond to the most reliable experimental observation available in the literature. Sometimes, assignment of the observations was provided in an investigation published at a later time, that is not referenced to in Table 5. This comment holds, in particular, for the experimental observations reported in Jacobson *et al.*[34] and O'Brien *et al.*,[46] assigned in Hoshina *et al.*[33] and Jacobson *et al.*,[49] respectively. Eventually, a number of *ungerade* states were reported in Hoshina *et al.*[33] arising from two different experimental observations with slightly different origins. Their mean value is provided in Table 5.

5. Assigned Experimental Vibrational States in $^{12}C_2D_2$

Table 6 gathers the experimental observations concerning vibrational states in $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$. It updates the extensive information provided in Herman *et al.*[31] by including more recent references. The vibrational term values of the pure bending states of Huet *et al.*[28] were calculated from the constants provided in this reference. The references provided in Table 6 correspond to the most reliable experimental observation available in the literature. The number of decimals printed in the state energies listed in Table 6 is directly related to the precision claimed by the related authors referred to in the last column of Table 6. Most authors do not comment on the accuracy of their spectral measurements and that information is thus not provided here.

As discussed in Sec. 4 for $^{12}C_2H_2$, a distinction is to be made between band centers (G_c) and vibrational energies (G_v) for states with $k>0$, related using Eq. (6). Here again, vibrational energies (G_v) are listed in Table 6. One should therefore again point out that experimentally reported hot bands are not listed using the band origin but, rather, using the vibrational energy (G_v) of the upper vibrational state.

6. Assigned Experimental Vibrational States in $^{13}C_2H_2$

Table 7 gathers the experimental observations concerning vibrational states in $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$. It updates the extensive information provided in Di Lonardo *et al.*[32] to include recent references. The references provided in Table 7 correspond to the most reliable experimental observation available in the literature. The number of decimals printed in the state energies listed in Table 7 is directly related to the precision claimed by the related authors referred to in the last column of Table 7. Most authors do not comment on the accuracy of their spectral measurements and that information is thus not provided here.

As discussed in Sec. 4 for $^{12}C_2H_2$, a distinction is to be made between energy band centers (G_c) and vibrational energies (G_v) for states with $k>0$, related using Eq. (6). Here again, vibrational energies (G_v) are listed in Table 7. One should therefore again point out that experimentally reported hot bands are not listed using the band origin but, rather, using the vibrational energy (G_v) of the upper vibrational state.

7. Partition Functions

The total internal molecular partition function $Q(T)$ is used to determine how molecules in thermodynamic equilibrium are distributed among the energy states at particular

TABLE 8. Degeneracy factors used in the calculations of the partition functions of symmetric isotopomers of acetylene

		$d_s(k=0)$		$d_s(k>0)$	
	d_i	Symmetric states	Antisymmetric states	Symmetric states	Antisymmetric states
$^{12}C_2H_2$	1	1	3	2	6
$^{12}C_2D_2$	1	6	3	12	6
$^{13}C_2H_2$	1	6	10	12	20

temperatures. An accurate knowledge of the partition function is required for many applications, e.g., calculation of thermodynamic properties, retrieval of concentration profiles of atmospheric species from measured intensities, correction of line intensities to temperatures other than those given, and determination of transition moments from line intensities.

The total internal molecular partition function is defined as the following direct sum:

$$Q(T)=\sum_s d_s d_i \exp\{-c_2 E_s/T\}, \tag{7}$$

which runs over all molecular states s (we use the same notation as in Gamache *et al.*[102]). In Eq. (7), d_s and d_i are the state-dependent and state-independent degeneracy factors provided in Table 8, c_2 is the second radiation constant, T is the temperature in Kelvin, and E_s is the total energy of state s, expressed in cm^{-1}. In the temperature range considered in this work, only levels of the ground electronic state contribute to the sum. As listed in Table 8, the state-independent degeneracy factor d_i is equal to 1 for all three species considered because all nuclei are paired, while the state-dependent degeneracy factors include the k degeneracy and nuclear spin statistical weight.

We have used the full set of predicted vibrational energies and rotational constants B_v provided in Secs. 9–11 to compute the total internal partition function of $^{12}C_2H_2$, $^{12}C_2D_2$, and $^{13}C_2H_2$ at temperatures in the range from 70 to 1500 K. The calculation was done by direct summation [Eq. (7)] at 5 K intervals for temperatures below 500 K, and at 20 K intervals above this temperature. Because of the lack of predicted values for the centrifugal distortion constants for the vibrational states, we have used the values available for the ground state (Kabbadj *et al.*[25]) to compute all vibration–rotation energies E_s. As an indication of the convergence of the calculated partition functions, Table 9 gives the variation of the partition function at three temperatures relative to the final value obtained, resulting from inclusion of the states lying within the last 500 cm^{-1} below the energy cutoff given between parentheses in this table.

TABLE 9. Variation of the partition function at three temperatures, relative to the final value obtained, resulting from inclusion of states lying within the last 500 cm^{-1} below the energy cutoff given in parentheses for each isotopomer (a dash corresponds to a variation less than 10^{-4}%)

T (K)	$^{12}C_2H_2$ (15 000 cm^{-1})	$^{12}C_2D_2$ (10 000 cm^{-1})	$^{13}C_2H_2$ (12 000 cm^{-1})
500	—	—	—
1000	—	0.03%	<0.01%
1500	0.03%	0.91%	0.21%

Following the procedure adopted in the HITRAN database (Rothman *et al.*[103]), we provide the total internal partition function in the form of coefficients of the following polynomial expansion in the temperature (see Goldman *et al.*[104] and references therein):

$$Q(T)=a+bT+cT^2+dT^3+eT^4. \tag{8}$$

The values of these coefficients were determined by fitting Eq. (8) to the values of the partition function calculated as detailed above. We used the same fitting procedure as described by Gamache *et al.*[102] We have thus separately fitted the data in the 70–500 and 500–1500 K temperature ranges. The values of the coefficients obtained are listed in Table 10. With these coefficients, the agreement with the calculated values of the partition function is better than ±0.15% in the 70–500 K range and ±0.3% in the 500–1500 K range for $^{12}C_2H_2$ and $^{13}C_2H_2$. These values rise to ±0.4% and ±1.1%, respectively, for $^{12}C_2D_2$.

When providing vibrational band strengths, knowledge of the vibrational partition function Q_{vib} is required [see for example Eq. (9) of Johns and Vander Auwera[105]]. This quantity, together with the rotational partition function Q_{rot}, is introduced in the so-called ''product approximation'' (Gamache *et al.*[102]), which assumes that the rotational structure in excited vibrational levels is the same as that of the ground state. Equation (7) then becomes:

$$Q(T)=\sum_{\text{vibrational states}} d_{vib}\exp\{-c_2E_{vib}/T\} \times \sum_{\text{rotational states}} d_{rot}\exp\{-c_2E_{rot}/T\}=Q_{vib}\times Q_{rot}, \tag{9}$$

in which E_{vib} and d_{vib} are the energy and degeneracy of the vibrational states and E_{rot} and d_{rot} are the energy and degeneracy of the rotational states. The rotational partition function can be easily calculated using rotational and centrifugal distortion constants of the ground state through either direct summation or—faster and as accurate—analytical expressions from McDowell.[106] The vibrational partition function can then be readily calculated.

The total internal partition functions obtained in this work for $^{12}C_2H_2$ are in very good agreement with those available in HITRAN in the range 70–500 K (Gamache *et al.*[102]). Indeed, differences (HITRAN—this work) range from −0.2% to +0.4%. The total internal partition functions determined here from 500 to 1500 K for the main isotopomer and from 70 to 1500 K for $^{12}C_2D_2$ and $^{13}C_2H_2$ are original. A comparison of the vibrational partition functions of $^{12}C_2H_2$ calculated here as the ratio of the total internal partition function to the rotational partition sum (computed using McDowell's[106] analytical expressions), with values computed using the harmonic oscillator approximation

TABLE 10. Polynomial coefficients for the total internal partition function, as defined in Eq. (8), for the two temperature ranges considered in this work: 70–500 K and 500–1500 K

	R^a	a	b	c	d	e
$^{12}C_2H_2$	L	-8.0680	1.4422	-2.5504×10^{-3}	8.3582×10^{-6}	0
	M	$3.2036\times10^{+3}$	$-1.8761\times10^{+1}$	4.5808×10^{-2}	-4.4946×10^{-5}	2.3419×10^{-8}
$^{12}C_2D_2$	L	$-3.5528\times10^{+1}$	4.8435	-1.2172×10^{-2}	4.5433×10^{-5}	0
	M	$-2.0105\times10^{+1}$	$-2.2003\times10^{+1}$	1.2389×10^{-1}	-1.9014×10^{-4}	1.4147×10^{-7}
$^{13}C_2H_2$	L	$-3.4550\times10^{+1}$	5.9535	-1.0901×10^{-2}	3.5921×10^{-5}	0
	M	$1.2863\times10^{+4}$	$-7.6055\times10^{+1}$	1.8802×10^{-1}	-1.8690×10^{-4}	9.9684×10^{-8}

[a]Temperature range: L is $70\leqslant T\leqslant 500$ K, M is $500<T\leqslant 1500$ K.

(Herzberg[23]) as done in HITRAN (Gamache *et al.*[102]) shows discrepancies ranging between -0.2% at 70 K and $+1.2\%$ at 1500 K. This increase with temperature of the discrepancy between the two methods results most probably from the neglect of the anharmonicity terms in the harmonic oscillator approximation.

8. Integrated Number of Vibrational States

The full set of predicted vibrational energies for each isotopomer provided in Secs. 9–11, thus corresponding to *all* vibrational states in a given energy window, was used to count vibrational states and calculate their integrated number $N(E)$. The energy E is defined with respect to the ground vibrational state. A polynomial of the form $N(E)=1+\alpha E^4+\beta E^5+\gamma E^7$ was then fitted to reproduce the evolution of the integrated number of vibrational states in each isotopomer (see El Idrissi *et al.*[107]). As discussed in Zhilinskii *et al.*[43] and detailed in El Idrissi *et al.*[107] this procedure does not account for a small, real oscillatory contribution in $N(E)$, that amounts up to a maximum of some ±250 states in $^{12}C_2H_2$, at the highest energy considered (15 000 cm^{-1}). This number drops to ±90 in $^{12}C_2D_2$ and ±110 in $^{13}C_2H_2$, again at the highest energies considered, i.e., 10 000 and 12 000 cm^{-1}, respectively. The results of this procedure are provided in Table 11. For clarity, one should emphasize that each state with a value of the total vibrational angular momentum $k>0$ brings a contribution of 2 in the integrated number of states resulting from the use of the parameters listed in Table 11.

As repeated in El Idrissi *et al.*,[107] different energy windows ΔE were used to calculate the number of states in different energy ranges. For instance, in $^{12}C_2H_2$, the selected windows were 100 cm^{-1} wide up to $E=5000\,cm^{-1}$, 50 cm^{-1} wide for $5000<E(cm^{-1})<8000$, and 20 cm^{-1} wide up for $8000<E(cm^{-1})<15\,000$.

9. Predicted Vibrational Energies and Principal Rotational Constants in $^{12}C_2H_2$

Using the various labels defined in Sec. 3, in Table 12 we list the predicted vibrational energy, principal rotational constant and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates. They were calculated from the results and model provided in El Idrissi *et al.*[30] In Table 12, predictions are listed up to 15 000 cm^{-1}. Fractions of basis states are mentioned provided they are larger than 25%. Only states with $k=0,1,2$ are printed. The full set of states, thus with all k values up to 15 000 cm^{-1}, is available in the section ''data files'' on the WEB site of the Service de Chimie Quantique et de Photophysique at the Université libre de Bruxelles (http://www.ulb.ac.be/cpm/).

10. Predicted Vibrational Energies and Principal Rotational Constants in $^{12}C_2D_2$

Using the various labels defined in Sec. 3, in Table 13 we list the predicted vibrational energy, principal rotational constant, and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates. They were calculated from the results and model provided in Herman *et al.*[31] In Table 13, predictions are listed up to 10 000 cm^{-1}. Fractions of basis states are mentioned provided they are larger than 25%. Only states with $k=0,1,2$ are printed. The full set of states, thus with all k values up to 10 000 cm^{-1}, is available in the section ''data files'' on the WEB site of the Service de Chimie Quantique et de Photophysique at the Université libre de Bruxelles (http://www.ulb.ac.be/cpm/).

11. Predicted Vibrational Energies and Principal Rotational Constants in $^{13}C_2H_2$

Using the various labels defined in Sec. 3, in Table 14 we list the predicted vibrational energy, principal rotational con-

TABLE 11. Coefficients of the polynomial $N(E)=1+\alpha E^4+\beta E^5+\gamma E^7$ reproducing the integrated number of vibrational states, $N(E)$, in $^{12}C_2H_2$, $^{12}C_2D_2$, and $^{13}C_2H_2$ as calculated from the predicted energy of the full set of vibrational states listed in Tables 12–14. The energy E is defined with respect to the ground vibrational state. Small oscillatory contributions (see text for their size) are not reproduced by the selected polynomial representation. The different energy windows ΔE used to calculate the number of states in different energy ranges are detailed. All energies are in cm^{-1}

	$^{12}C_2H_2$	$^{12}C_2D_2$	$^{13}C_2H_2$
$\Delta E=100$	$0<E<5000$		$0<E<5000$
$\Delta E=50$	$5000<E<8000$	$0<E<5000$	
$\Delta E=20$	$8000<E<15\,000$	$5000<E<10\,000$	$5000<E<12\,000$
α (cm^4)	4.4499×10^{-13}	1.4351×10^{-12}	6.2003×10^{-13}
β (cm^5)	2.7573×10^{-17}	3.3056×10^{-17}	6.8511×10^{-18}
γ (cm^7)	1.4290×10^{-25}	9.7233×10^{-25}	2.2402×10^{-25}

stant, and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates. They were calculated from the results and model provided in Di Lonardo *et al.*[32] In Table 14, predictions are listed up to 12 000 cm^{-1}. Fractions of basis states are mentioned provided they are larger than 25%. Only states with $k=0,1,2$ are printed. The full set of states, thus with all k values up to 12 000 cm^{-1}, is available in the section ''data files'' on the WEB site of the Service de Chimie Quantique et de Photophysique at the Université libre de Bruxelles (http://www.ulb.ac.be/cpm/).

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TABLE 5. Assigned experimental states in $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$, with dominant assignment indicated in terms of the normal mode quantum numbers. The symmetry and vibrational angular momentum $k=l_4+l_5$ of the state is provided, together with the vibrational energy, G_v in cm^{-1}. The reference given corresponds to the most reliable experimental observation. A number of states were vibrationally assigned in a posterior contribution. This is, in particular, the case of many states observed in Jacobson *et al.* (jacob98a)[34] and O'Brien *et al.* (obrien98)[46] later assigned in Hoshina *et al.* (hoshi01)[33] and Jacobson *et al.* (jacob98b),[49] respectively. Only levels vibrationally assigned, usually using the Cluster model of El Idrissi *et al.* (elid99)[30] and Hoshina *et al.* (hoshi01)[33] are listed. A number of levels reported in Jacobson *et al.* (jacob98a)[34] (Table 1), O'Brien *et al.* (obrien98)[46] (Table 1) and Solina *et al.* (solina96)[47] (Tables 3 and 4) for which a full vibrational assignment is still missing, are therefore not listed in the table. This comment also applies to the states at 19 410.934, 19 427.703, 20 321.281, 20 332.174, 20 351.07, and 20 394.396 cm^{-1} reported by Hall (hall84),[56] probably of Σ_u^+ symmetry with the latter observation however raising problems because of an abnormally low principal rotational constant B_v', to the Σ_u^+ state at 12 561.821 cm^{-1} and to the Π_u state at 12 709.95 cm^{-1} by Zhan and Halonen (halo93b),[59] to the states at 14 259.787, 14 532.274, 16 566.34, and to the Σ_u^+ state at 14 609.567 cm^{-1} reported by Campargue *et al.* (camp98)[42] and also to the Π_u states at 13 180.173 and 15 145.16 cm^{-1} observed by Campargue *et al.* (camp97),[40] none of them being fully identified in the literature, yet. A number of states reported by Jacobson *et al.* (jacob98b)[49] are listed, despite not fully assigned, because only the l_4 and l_5 values remain doubtful, probably because of lack of spectral resolution. Eventually, the Table does not include observations from Table V of Jonas *et al.* (jona93)[48] and Table V of Solina *et al.* (solina96),[47] which happen not to be included in global fitting procedures neither in El Idrissi *et al.* (elid99)[30] nor in Hoshina *et al.* (hoshi01)[33]

G_v*	State[a]	Cluster[b]	Ref.**
612.871	0001^10^0	$\{0,1,1,g\}$	pliv72
730.332	0000^01^1	$\{0,1,1,u\}$	pliv72
1 230.39	0002^00^0	$\{0,2,0,g\}$	pliv72
1 233.52	0002^20^0	$\{0,2,2,g\}$	pliv72
1 328.074	0001^11^{-1}	$\{0,2,0,u^+\}$	pliv72
1 340.552	$0001^{-1}1^1$	$\{0,2,0,u^-\}$	pliv72
1 347.520	0001^11^1	$\{0,2,2,u\}$	pliv72
1 449.112	0000^02^0	$\{0,2,0,g\}$	pliv72
1 463.016	0000^02^2	$\{0,2,2,g\}$	pliv72
1 855.72	0003^10^0	$\{0,3,1,g\}$	pliv72
1 861.93	0003^30^0	$\{0,3,3,g\}$	pliv72
1 941.179	0002^21^{-1}	$\{0,3,1,u\}$	pliv72
1 960.874	0002^01^1	$\{0,3,1,u\}$	pliv72
1 972.56	0002^21^1	$\{0,3,3,u\}$	kabb91
1 974.316	0100^00^0	$\{1,3,0,g^+\}$	kabb91
2 049.059	$0001^{-1}2^2$	$\{0,3,1,g\}$	pliv72
2 066.99	0001^12^0	$\{0,3,1,g\}$	kabb91
2 084.81	0001^12^2	$\{0,3,3,g\}$	kabb91
2 170.343	0000^03^1	$\{0,3,1,u\}$	pliv72
2 198.09	0000^03^3	$\{0,3,3,u\}$	kabb91
2 560.6	0003^11^{-1}	$\{0,4,0,u^+\}$	pliv72
2 561.526	0003^31^{-1}	$\{0,4,2,u\}$	pliv72
2 574.7	0101^00^0	$\{1,4,1,g\}$	pliv72
2 583.845	$0003^{-1}1^1$	$\{0,4,0,u^-\}$	pliv72
2 589.683	0003^11^1	$\{0,4,2,u\}$	pliv72
2 648.018	0002^22^{-2}	$\{0,4,0,g^+\}$	pliv72
2 661.188	$0002^{-2}2^2$	$\{0,4,0,g^-\}$	pliv72
2 666.151	0002^22^0	$\{0,4,2,g\}$	pliv72
2 703.076	0100^01^1	$\{1,4,1,u\}$	smit88
2 757.798	0001^13^{-1}	$\{0,4,0,u^+\}$	pliv72
2 773.193	$0001^{-1}3^3$	$\{0,4,2,u\}$	pliv72
2 783.651	$0001^{-1}3^1$	$\{0,4,0,u^-\}$	pliv72
2 795.500	0001^13^1	$\{0,4,2,u\}$	pliv72
2 880.22	0000^04^0	$\{0,4,0,g^+\}$	pliv72
2 894.069	0000^04^2	$\{0,4,2,g\}$	pliv72
3 281.899	0101^11^{-1}	$\{1,5,0,u^+\}$	vand93
3 294.839	0010^00^0	$\{1,5,0,u^+\}$	vand93
3 300.637	$0101^{-1}1^1$	$\{1,5,0,u^-\}$	vand93
3 307.713	0101^11^1	$\{1,5,2,u\}$	vand93
3 372.849	1000^00^0	$\{1,5,0,g^+\}$	tolo92
3 420.388	0100^02^0	$\{1,5,0,g^+\}$	tolo92
3 434.113	0100^02^2	$\{1,5,2,g\}$	tolo92
3 818.44	0005^11^{-1}	$\{0,6,0,u^+\}$	hoshi01
3 820.24	0005^31^{-1}	$\{0,6,2,u\}$	hoshi01
3 850.32	0005^11^{-1}	$\{0,6,0,u^-\}$	hoshi01
3 855.82	0005^11^{-1}	$\{0,6,2,u\}$	hoshi01
3 882.41	0011^10^0	$\{1,6,1,u\}$	laff90
3 898.34	0011^10^0	$\{1,6,1,u\}$	laff90
3 933.897	0200^00^0	$\{2,6,0,g^+\}$	berm98
3 970.050	1001^10^0	$\{1,6,1,g\}$	smit88
4 002.440	0010^01^1	$\{1,6,1,g\}$	laff90
4 016.710	0010^01^1	$\{1,6,1,g\}$	laff90

TABLE 5. Assigned experimental states in $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$, with dominant assignment indicated in terms of the normal mode quantum numbers—Continued

G_v*	State[a]	Cluster[b]	Ref.**
4 092.345	$1000^0 1^1$	{1,6,1,u}	dcun91
4 140.055	$0100^0 3^1$	{1,6,1,u}	dcun91
4 488.85	$0103^1 1^{-1}$	{1,7,0,u^+}	rins82
4 489.05	$0012^0 0^0$	{1,7,0,u^+}	hoshi01
4 490.81	$0103^3 1^{-1}$	{1,7,2,u}	rins82
4 490.96	$0103^3 1^{-1}$	{1,7,2,u}	hoshi01
4 508.03	$0012^0 0^0$	{1,7,0,u^+}	rins82
4 509.21	$0012^2 0^0$	{1,7,2,u}	rins82
4 509.81	$0102^2 0^0$	{1,7,2,u}	hoshi01
4 521.07	$0103^{-1} 1^1$	{1,7,0,u^-}	hoshi01
4 527.25	$0103^1 1^1$	{1,7,2,u}	hoshi01
4 599.78	$0102^{-2} 2^2$	{1,7,0,g^-}	rins82
4 608	$0102^2 2^0$	{1,7,2,g}	rins82
4 609.33	$0011^1 1^{-1}$	{1,7,0,g^+}	rins82
4 617.92	$0011^{-1} 1^1$	{1,7,0,g^-}	rins82
4 624.79	$0011^1 1^1$	{1,7,2,g}	rins82
4 658.31	$0103^1 1^{-1}$	{1,7,0,u^+}	hoshi01
4 673.63	$1001^1 1^{-1}$	{1,7,0,u^+}	dcun91
4 688.84	$1001^{-1} 1^1$	{1,7,0,u^+}	dcun91
4 692.06	$1001^1 1^1$	{1,7,2,u}	dcun91
4 710.74	$0101^1 3^{-1}$	{1,7,0,u^+}	rins82
4 725.85	$0101^{-1} 3^3$	{1,7,2,u}	rins82
4 727.06	$0010^0 2^0$	{1,7,0,u^+}	rins82
4 741.04	$0010^0 2^2$	{1,7,2,u}	rins82
4 800.14	$1000^0 2^0$	{1,7,0,g^+}	dcun91
4 814.2	$1000^0 2^2$	{1,7,2,g}	dcun91
5 068.8[c]	$0008^2 0^0$	{0,8,2,g}	jacob98a
5 068.8[c]	$0008^0 0^0$	{0,8,0,g^+}	jacob98a
5 069.72	$0008^0 0^0$	{0,8,0,g^+}	abbo96a
5 098.38	$0007^1 1^{-1}$	{0,8,0,u^+}	hoshi01
5 100.92	$0007^3 1^{-1}$	{0,8,2,u}	hoshi01
5 102.79	$0013^1 0^0$	{1,8,1,u}	smit88
5 124.587	$0013^1 0^0$	{1,8,1,u}	smit88
5 137.37	$0007^{-1} 1^1$	{0,8,0,u^-}	hoshi01
5 142.63	$0007^1 1^1$	{0,8,2,u}	hoshi01
5 198.86	$0005^1 3^{-1}$	{0,8,0,u^+}	hoshi01
5 221	$0006^0 2^0$	{0,8,2,g}	jacob98a
5 226.7	$0005^1 3^1$	{0,8,2,u}	hoshi01
5 230.022	$0201^1 1^{-1}$	{2,8,0,u^+}	smit88
5 254.53	$0005^3 3^{-3}$	{0,8,0,u^+}	hoshi01
5 260.002	$0110^0 0^0$	{2,8,0,u^+}	smit88
5 262.39	$0005^{-1} 3^3$	{0,8,2,u}	hoshi01
5 269.729	$1002^2 1^{-1}$	{1,8,1,u}	palm72
5 290.283	$1002^2 1^{-1}$	{1,8,1,u}	palm72
5 298.93	$0005^{-1} 3^1$	{0,8,0,u^-}	hoshi01
5 302.4	$1002^0 1^1$	{1,8,1,u}	plyl63
5 306.06	$0005^1 3^1$	{0,8,2,u}	hoshi01
5 335.549	$1100^0 0^0$	{2,8,0,g^+}	berm99
5 382.738	$1001^1 2^0$	{1,8,1,g}	bald72
5 510.59	$1000^0 3^1$	{1,8,1,u}	plyl63
5 676.3	$0106^2 0^0$	{0,9,2,g}	jacob98b
5 676.3	$0106^0 0^0$	{0,9,0,g^+}	jacob98b
5 722.06	$0014^0 0^0$	{1,9,0,u^+}	hoshi01
5 724.85	$0014^2 0^0$	{1,9,2,u}	hoshi01
5 747.35	$0105^1 1^{-1}$	{1,9,0,u^+}	hoshi01
5 748.99	$0105^3 1^{-1}$	{1,9,2,u}	hoshi01
5 767.39	$0105^{-1} 1^1$	{1,9,0,u^-}	hoshi01
5 772.88	$0105^1 1^1$	{1,9,2,u}	hoshi01
5 818.042	$0202^2 1^{-1}$	{2,9,1,u}	smit88
5 851.808	$0111^1 0^0$	{2,9,1,u}	smit88
5 873.6	$0104^0 2^2$	{0,9,2,g}	jacob98b
5 873.6	$0104^0 2^0$	{0,9,0,g^+}	jacob98b
5 973.64	$0103^1 3^1$	{1,9,2,u}	hoshi01
6 386.1	$00010^2 0^0$	{0,10,2,g}	jacob98a
6 386.1	$00010^0 0^0$	{0,10,0,g^+}	jacob98a

TABLE 5. Assigned experimental states in $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$, with dominant assignment indicated in terms of the normal mode quantum numbers—Continued

G_v*	State[a]	Cluster[b]	Ref.**
6 387.82	$00010^0 0^0$	$\{0,10,0,g^+\}$	abbo96a
6 395.3	$0009^1 1^{-1}$	$\{0,10,0,u^+\}$	hoshi01
6 398.75	$0009^3 1^{-1}$	$\{0,10,2,u\}$	hoshi01
6 413.899	$0203^1 1^{-1}$	$\{2,10,0,u^+\}$	kou94
6 414.33	$0203^1 1^{-1}$	$\{2,10,0,u^+\}$	hoshi01
6 414.58	$0203^3 1^{-1}$	$\{2,10,2,u\}$	hoshi01
6 423	$0008^4 2^{-2}$	$\{0,10,2,g\}$	jacob98a
6 423	$0008^0 2^0$	$\{0,10,0,g^+\}$	jacob98a
6 424.62	$0008^2 2^{-2}$	$\{0,10,0,g^+\}$	abbo96a
6 440.2	$0009^{-1} 1^1$	$\{0,10,0,u^+\}$	hoshi01
6 442.94	$0203^{-1} 1^1$	$\{2,10,0,u^-\}$	hoshi01
6 445.53	$0109^1 1^1$	$\{0,10,2,u\}$	hoshi01
6 449.104	$0112^0 0^0$	$\{2,10,0,u^+\}$	kou94
6 449.21	$0112^0 0^0$	$\{2,10,0,u^+\}$	hoshi01
6 452.43	$0112^2 0^0$	$\{2,10,2,u\}$	kepp96
6 452.69	$0112^2 0^0$	$\{2,10,2,u\}$	hoshi01
6 460.63[d]	$0007^1 3^{-1}$	$\{0,10,0,u^+\}$	hoshi01
6 462.1	$0008^0 2^2$	$\{0,10,2,g\}$	jacob98a
6 493.36	$0007^5 3^{-1}$	$\{0,10,2,u\}$	hoshi01
6 502.325	$0020^0 0^0$	$\{2,10,0,g^+\}$	smit88
6 509.95	$0008^0 2^0$	$\{0,10,0,g^+\}$	abbo96a
6 511	$0008^2 0^0$	$\{0,10,2,g\}$	jacob98a
6 514.012	$0020^0 0^0$	$\{2,10,0,g^+\}$	smit88
6 528.28	$0107^3 3^{-1}$	$\{0,10,0,u^+\}$	hoshi01
6 534.11	$0007^{-1} 3^3$	$\{0,10,2,u\}$	hoshi01
6 556.465	$1010^0 0^0$	$\{2,10,0,u^+\}$	kou94
6 581.57	$0007^{-1} 3^1$	$\{0,10,0,u^+\}$	hoshi01
6 588.23	$0007^1 3^1$	$\{0,10,2,u\}$	hoshi01
6 623.136	$1101^1 1^{-1}$	$\{2,10,0,u^+\}$	kou94
6 654.251	$0201^1 3^{-1}$	$\{2,10,0,u^+\}$	kou94
6 658.5	$0006^2 4^{-2}$	$\{0,10,0,g^+\}$	jacob98a
6 664.5	$0006^0 4^2$	$\{0,10,2,g\}$	jacob98a
6 690.574	$0110^0 2^0$	$\{2,10,0,u^+\}$	kou94
6 709.016	$2000^0 0^0$	$\{2,10,0,g^+\}$	smit88
6 945.33	$0205^1 0^0$	$\{2,11,1,g\}$	jona92
6 950.41	$0205^3 0^0$	$\{2,11,3,g\}$	jona92
6 958.01	$0108^0 0^0$	$\{1,11,0,g^+\}$	jona93
6 961.43	$0108^2 0^0$	$\{1,11,2,g\}$	jona93
6 971.53	$0108^4 0^0$	$\{1,11,4,g\}$	jona92
6 978.07	$0016^0 0^0$	$\{1,11,0,u^+\}$	hoshi01
6 981.41	$0016^2 0^0$	$\{1,11,2,u\}$	hoshi01
7 010.85	$0107^1 1^{-1}$	$\{1,11,0,u^+\}$	hoshi01
7 012.8	$0107^3 1^{-1}$	$\{1,11,2,u\}$	hoshi01
7 020.62	$0015^1 1^{-1}$	$\{1,11,0,g^+\}$	jona93
7 023.66	$0015^3 1^{-1}$	$\{1,11,2,g\}$	jona93
7 034.59	$0302^0 0^0$	$\{3,11,0,g^+\}$	jona93
7 035.56	$0107^{-1} 1^1$	$\{1,11,0,u^-\}$	hoshi01
7 036.4	$0302^2 0^0$	$\{3,11,2,g\}$	jona93
7 041	$0107^1 1^1$	$\{1,11,2,u\}$	hoshi01
7 069.86	$0106^0 2^2$	$\{1,11,2,g\}$	jona93
7 079.87	$0014^2 2^{-2}$	$\{1,11,0,u^+\}$	hoshi01
7 080.7	$1006^2 0^0$	$\{1,11,2,g\}$	jona93
7 081.33	$1006^0 0^0$	$\{1,11,0,g^+\}$	jona93
7 085.7	$0014^4 2^{-2}$	$\{1,11,2,u\}$	hoshi01
7 092.43	$0021^1 0^0$	$\{2,11,1,g\}$	kepp96
7 099.56	$0015^1 1^1$	$\{1,11,2,g\}$	jona93
7 108.05	$0021^1 0^0$	$\{2,11,1,g\}$	kepp96
7 110.14	$0014^{-2} 2^2$	$\{1,11,0,u^-\}$	hoshi01
7 116.02	$0105^1 3^{-1}$	$\{1,11,0,u^+\}$	hoshi01
7 120.75	$0106^0 2^0$	$\{1,11,0,g^+\}$	jona93
7 121.68	$1005^3 1^{-1}$	$\{1,11,2,u\}$	hoshi01
7 122.6	$0106^0 2^0$	$\{0,11,0,g^+\}$	jacob98b
7 127.53	$0106^0 2^2$	$\{1,11,2,g\}$	jona93
7 142.66	$1011^1 0^0$	$\{2,11,1,u\}$	bald77
7 154.55	$0105^3 3^{-3}$	$\{1,11,0,u^+\}$	hoshi01

TABLE 5. Assigned experimental states in $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$, with dominant assignment indicated in terms of the normal mode quantum numbers—Continued

G_v*	State[a]	Cluster[b]	Ref.**
7 161.91	$0014^2 2^0$	{1,11,2,u}	hoshi01
7 164.3	$1005^{-1}1^1$	{1,11,0,u^-}	hoshi01
7 169.9	$1005^1 1^1$	{1,11,2,u}	hoshi01
7 182.15	$0014^0 2^0$	{1,11,0,u^+}	hoshi01
7 190.58	$0014^0 2^2$	{1,11,2,u}	hoshi01
7 207.123	$1102^2 1^{-1}$	{2,11,1,u}	bald77
7 213.36	$0105^{-1}3^1$	{1,11,0,u^-}	hoshi01
7 218.65	$0115^1 3^1$	{1,11,2,u}	hoshi01
7 219.366	$0020^0 1^1$	{2,11,1,u}	bald77
7 229.445	$0020^0 1^1$	{2,11,1,u}	bald77
7 265.06	$1010^0 1^1$	{2,11,1,g}	smit88
7 297.55	$2001^1 0^0$	{2,11,1,g}	bald77
7 330.53	$1101^1 2^0$	{2,11,1,g}	bald77
7 416.69	$2000^0 1^1$	{2,11,1,u}	plyl63
7 467.64	$1100^0 3^1$	{2,11,1,u}	smit88
7 570.5	$0206^2 0^0$	{2,12,2,g}	jacob98b
7 570.5	$0206^0 0^0$	{2,12,0,g^+}	jacob98b
7 627	$0205^1 1^{-1}$	{0,12,0,u^+}	hoshi01
7 628.78	$0205^3 1^{-1}$	{0,12,2,u}	hoshi01
7 665.89	$0114^0 0^0$	{0,12,0,u^+}	hoshi01
7 668.48	$0205^{-1}1^1$	{0,12,0,u^-}	hoshi01
7 674.68	$0205^1 1^1$	{0,12,2,u}	hoshi01
7 690.06	$0022^2 0^0$	{2,12,2,g}	kepp96
7 694.74	$0009^1 3^1$	{0,12,0,u^+}	hoshi01
7 697.4	$00010^0 2^0$	{0,12,0,g^+}	abbo96a
7 699.63	$0009^3 3^{-1}$	{0,12,2,u}	hoshi01
7 732.677	$1012^0 0^0$	{2,12,0,u^+}	weir01
7 732.91	$00012^0 0^0$	{0,12,0,g^+}	abbo96a
7 733.6	$00012^2 0^0$	{0,12,2,g}	jacob98a
7 733.6	$00012^0 0^0$	{0,12,0,g^+}	jacob98a
7 737.096	$1012^2 0^0$	{2,12,2,u}	weir01
7 744.92	$00011^1 1^{-1}$	{0,12,0,u^+}	hoshi01
7 745.15	$0009^5 3^{-3}$	{0,12,2,u}	hoshi01
7 753.9	$00010^0 2^2$	{0,12,2,g}	jacob98a
7 772	$0008^4 4^{-4}$	{0,12,0,g^+}	abbo96a
7 773	$0113^1 1^{-1}$	{2,12,0,g^+}	jacob98b
7 773	$0113^1 1^1$	{2,12,2,g}	jacob98b
7 773.3	$00010^2 2^{-2}$	{0,12,0,g^+}	jacob98a
7 773.3	$0108^6 4^{-4}$	{0,12,2,g}	jacob98a
7 773.34	$00011^{-1}1^{-1}$	{0,12,0,u^-}	hoshi01
7 779.56	$01011^1 1^1$	{0,12,2,u}	hoshi01
7 787.328	<25	{2,12,0,u^+}	weir01
7 805.005	$0021^1 1^{-1}$	{2,12,0,u^+}	kepp96
7 808.5	$0108^0 4^0$	{0,12,2,g^+}	jacob98a
7 813.61	$0008^0 4^0$	{0,12,0,g^+}	abbo96a
7 814	$0108^2 0^0$	{0,12,2,g}	jacob98a
7 834.99	$1011^1 1^{-1}$	{2,12,0,g^+}	kepp96
7 836	$0008^4 4^{-4}$	{0,12,0,g^+}	jacob98a
7 838.21	$0008^4 4^{-4}$	{0,12,0,g^+}	abbo96a
7 843	$0006^0 4^2$	{0,12,2,g}	jacob98a
7 852.32	$1011^1 1^1$	{2,12,2,g}	kepp96
7 951.5	$0006^0 6^2$	{0,12,2,g}	jacob98a
7 951.5	$0006^0 6^0$	{0,12,0,g^+}	jacob98a
7 961.82	$1010^0 2^0$	{2,12,0,u^+}	kepp96
7 976.14	$1010^0 2^2$	{2,12,2,u}	kepp96
7 994.400	$2001^1 1^{-1}$	{2,12,0,u^+}	weir01
7 998.635	$1200^0 1^1$	{3,12,1,u}	weir01
8 034.27	$0300^0 3^1$	{3,12,1,u}	weir01
8 251.19	$0018^0 0^0$	{1,13,0,u^+}	hoshi01
8 255.09	$0018^2 0^0$	{1,13,2,u}	hoshi01
8 294.31	$0109^1 1^{-1}$	{1,13,0,u^+}	hoshi01
8 296.77	$0109^3 1^{-1}$	{1,13,2,u}	hoshi01
8 315.54	$0016^2 2^{-2}$	{1,13,0,u^+}	hoshi01
8 320.38	$0303^3 1^{-1}$	{3,13,2,u}	hoshi01
8 320.98	$0303^1 1^{-1}$	{3,13,0,u^+}	hoshi01

TABLE 5. Assigned experimental states in $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$, with dominant assignment indicated in terms of the normal mode quantum numbers—Continued

G_v*	State[a]	Cluster[b]	Ref.**
8 323.91	$0109^1 1^1$	{1,13,2,u}	hoshi01
8 348.8	$0303^{-1} 1^1$	{3,13,0,u^-}	hoshi01
8 353.6	$0303^1 1^1$	{3,13,2,u}	hoshi01
8 354.91	$0006^{-2} 2^2$	{1,13,0,u^-}	hoshi01
8 358.11	$0107^5 3^{-3}$	{1,13,2,u}	hoshi01
8 366.8	$0016^4 2^{-2}$	{1,13,2,u}	hoshi01
8 377.21	$0212^0 0^0$	{3,13,0,u^+}	hoshi01
8 379.45	$0212^2 0^0$	{3,13,2,u}	hoshi01
8 440.89	$0006^0 2^0$	{1,13,0,u^+}	hoshi01
8 449.87	$0016^0 2^2$	{1,13,2,u}	hoshi01
8 467.267	$0120^0 0^0$	{3,13,0,g^+}	halo99
8 477.34	$0107^{-1} 3^1$	{1,13,0,u^-}	hoshi01
8 482.22	$0107^1 3^1$	{1,13,2,u}	hoshi01
8 512.061	$1110^0 0^0$	{3,13,0,u^+}	kou94
8 556.595	$1201^1 1^{-1}$	{3,13,0,u^+}	kou94
8 581.765	$0301^1 3^{-1}$	{3,13,0,u^+}	kou94
8 640.017	$0210^0 2^0$	{3,13,0,u^+}	kou94
8 836.3	$0208^2 0^0$	{2,14,2,g}	jacob98b
8 836.3	$0208^0 0^0$	{2,14,0,g^+}	jacob98b
8 863.63	$0207^1 1^{-1}$	{2,14,0,u^+}	hoshi01
8 866.5	$0207^3 1^{-1}$	{2,14,2,u}	hoshi01
8 904.81	$0116^0 0^0$	{2,14,0,u^+}	hoshi01
8 906.9	$0116^2 0^0$	{2,14,2,u}	hoshi01
8 918.25	$0207^{-1} 1^1$	{2,14,0,u^-}	hoshi01
8 923.92	$0207^1 1^1$	{2,14,2,u}	hoshi01
8 939.27	$1014^2 0^0$	{2,14,2,u}	hoshi01
8 971.76	$00011^{-1} 3^1$	{1,14,0,u^+}	hoshi01
8 980.24	$00111^3 3^{-1}$	{1,14,2,u}	hoshi01
9 012.6	$0206^0 2^0$	{2,14,0,g^+}	jacob98b
9 012.6	$0206^0 2^0$	{2,14,2,g}	jacob98b
9 031.38	$00013^{-1} 1^1$	{1,14,0,u^+}	hoshi01
9 039.36	$00013^3 1^{-1}$	{1,14,0,u^+}	hoshi01
9 041	$00012^0 0^0$	{0,14,0,g^+}	jacob98a
9 045.66	$00013^1 1^{-1}$	{1,14,2,u}	hoshi01
9 046	$00012^0 2^2$	{0,14,2,g}	jacob98a
9 073.4	$00012^2 2^{-2}$	{0,14,0,g^+}	jacob98a
9 073.4	$00012^4 2^{-2}$	{0,14,2,g}	jacob98a
9 086.159	$1111^1 0^0$	{3,14,1,u}	weir01
9 090.3	$0001^2 0^2$	{0,14,2,g}	jacob98a
9 090.3	$00010^4 4^{-1}$	{0,14,2,g^+}	jacob98a
9 102.6	$0008^{-2} 6^4$	{0,14,2,g}	jacob98a
9 115.52	$00013^1 1^1$	{1,14,2,u}	hoshi01
9 136.2	$00014^0 0^0$	{0,14,0,g^+}	jacob98a
9 143.5	$00014^2 0^0$	{0,14,2,g}	jacob98a
9 151.732	$0310^0 0^0$	{4,14,0,u^+}	smit88
9 162.5	$0008^6 6^{-6}$	{0,14,2,g^+}	jacob98a
9 162.5	$00010^{-2} 4^4$	{0,14,2,g}	jacob98a
9 178.524	$0120^0 1^1$	{3,14,1,u}	smit88
9 225.22	$0018^0 2^0$	{1,15,0,u^+}	hoshi01
9 238	$0008^4 6^{-6}$	{0,14,2,g}	jacob98a
9 367.753	$2100^0 1^1$	{3,14,1,u}	herm89
9 408.88	$1200^0 3^1$	{3,14,1,u}	sini80
9 449.4	$0306^2 0^0$	{3,15,2,g}	jacob98b
9 449.4	$0306^0 0^0$	{3,15,0,g^+}	jacob98b
9 513.64	$0305^1 1^{-1}$	{3,15,0,u^+}	hoshi01
9 514.28	$0315^3 1^{-1}$	{3,15,2,u}	hoshi01
9 531.52	$0018^2 2^2$	{1,15,2,u}	hoshi01
9 554.91	$0305^{-1} 1^1$	{3,15,1,u^-}	hoshi01
9 556.73	$0305^1 1^1$	{3,15,2,u}	hoshi01
9 570.83	$0214^0 0^0$	{3,15,0,u^+}	hoshi01
9 573.64	$0214^1 0^0$	{3,15,2,u}	hoshi01
9 593.97	$0018^{-2} 1^2$	{1,15,0,u^-}	hoshi01
9 597.6	$01011^3 1^{-1}$	{1,15,2,u}	hoshi01
9 629.1	$00110^0 0^0$	{1,15,0,u^+}	hoshi01
9 630.64	$01011^{-1} 1^1$	{1,15,0,u^-}	hoshi01

TABLE 5. Assigned experimental states in $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$, with dominant assignment indicated in terms of the normal mode quantum numbers—Continued

G_v*	State[a]	Cluster[b]	Ref.**
9 637.35	$01011^1 1^1$	{1,15,2,u}	hoshi01
9 639.854	$0030^0 0^0$	{3,15,0,u^+}	herm89
9 663.351	$1020^0 0^0$	{3,15,0,g^+}	halo99
9 664.42	$1112^2 0^0$	{3,15,2,u}	abbo96b
9 665.8	$0304^0 2^0$	{3,15,2,g}	jacob98b
9 665.8	$0304^0 2^0$	{3,15,0,g^+}	jacob98b
9 668.126	$1112^0 0^0$	{3,15,0,u^+}	herm89
9 681.53	$01011^1 1^1$	{1,15,0,u^+}	hoshi01
9 682.1	$1009^3 1^{-1}$	{1,15,2,u}	hoshi01
9 741.619	$0121^1 1^{-1}$	{3,15,0,u^+}	herm89
9 744.547	$0303^3 3^{-3}$	{3,15,0,u^+}	herm89
9 787.52	$0212^2 2^{-2}$	{3,15,0,u^+}	abbo96b
9 835.163	$2010^0 0^0$	{3,15,0,u^+}	herm89
9 909.887	$1110^0 2^0$	{3,15,0,u^+}	herm89
9 955.28	$1201^1 3^{-1}$	{3,15,0,u^+}	abbo96b
10 215.542	$0031^1 0^0$	{3,16,1,u}	ding02
10 256.555	$1113^1 0^0$	{3,16,1,u}	ding02
10 288.813	$0312^0 0^0$	{4,16,0,u^+}	ding02
10 328.602	<25	{3,16,1,u}	ding02
10 337.865	$0304^{-2} 3^3$	{3,16,1,u}	ding02
10 343.644	$0030^0 1^1$	{3,16,1,g}	herm89
10 350.643	$1204^0 1^1$	{3,16,1,u}	ding02
10 352.687	$1112^2 1^{-1}$	{3,16,1,g}	herm89
10 365.998	$1020^0 1^1$	{3,16,1,u}	ding02
10 414.701	$2011^1 0^0$	{3,16,1,u}	ding02
10 450.392	$1210^0 0^0$	{4,16,0,u^+}	ding02
10 475.034	$1301^1 1^{-1}$	{4,16,0,u^+}	ding02
10 494.715	$0401^1 3^{-1}$	{4,16,0,u^+}	ding02
10 511.888	$2102^2 1^{-1}$	{3,16,1,u}	ding02
10 526.983	$2102^0 1^1$	{3,16,1,u}	ding02
10 689.624	$3000^0 1^1$	{3,16,1,u}	weir01
10 698.1	$0308^{0/2} 0^0$	{3,17,0/2,g}	jacob98b
10 759.313	$2100^0 3^1$	{3,16,1,u}	weir01
10 785.502	$0216^0 0^0$	{3,17,0,u^+}	weir01
10 798.506	$0032^0 0^0$	{3,17,0,u^+}	weir01
10 849.026	<25	{3,17,0,u^+}	weir01
10 886.4	$0306^? 2^?$	{3,17,0/2,g}	jacob98b
10 906.195	$0123^1 1^{-1}$	{3,17,0,u^+}	weir01b
10 920.123	$1021^1 1^{-1}$	{3,17,0,u^+}	weir01
10 921.092	$0117^3 2^{-2}$	{2,17,1,u}	weir01
10 929.329	$1021^1 1^{-1}$	{3,17,0,u^+}	weir01
11 010.657	$1211^1 0^0$	{4,17,1,u}	weir01
11 032.773	$0402^2 3^{-1}$	{4,17,1,u}	weir01
11 042.901	$0030^0 2^0$	{3,17,0,u^+}	weir01
11 075.605	$0410^0 2^0$	{5,17,0,u^+}	weir01
11 301.897	$2200^0 1^1$	{4,17,1,u}	weir01
11 309	$0406^{0/2} 0^0$	{4,18,0/2,g}	jacob98b
11 376.522	$0400^0 5^1$	{4,17,1,u}	weir01
11 543.4	$0404^? 2^?$	{4,18,0/2,g}	jacob98b
11 570.606	$1212^0 0^0$	{4,18,0,u^+}	halo93a
11 586.363	$0403^1 3^{-1}$	{4,18,0,u^+}	halo93a
11 599.811	$0130^0 0^0$	{4,18,0,u^+}	halo93a
11 603.192	$0403^3 3^{-1}$	{4,18,2,u}	halo93a
11 620.453	$1303^1 1^{-1}$	{4,18,0,u^+}	halo93a
11 663.166	$0221^1 1^{-1}$	{4,18,0,u^+}	halo93a
11 706.676	$0221^1 1^{-1}$	{4,18,0,u^+}	halo93a
11 782.866	$2110^0 0^0$	{4,18,0,u^+}	halo93a
11 837.148	$1210^0 2^0$	{4,18,0,u^+}	halo93a
12 138.300	$1213^1 0^0$	{4,19,1,u}	halo93a
12 153.015	$0404^4 3^{-3}$	{4,19,1,u}	halo93a
12 171.395	$0404^4 3^{-3}$	{4,19,1,u}	halo93a
12 279.019	$0313^3 2^{-2}$	{4,19,1,u}	halo93a
12 296.935	$0130^0 1^1$	{4,19,1,g}	halo93a
12 301.943	$0403^{-3} 4^4$	{4,19,1,g}	halo93a
12 311.818	$1120^0 1^1$	{4,19,1,u}	mets01

TABLE 5. Assigned experimental states in $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$, with dominant assignment indicated in terms of the normal mode quantum numbers—Continued

G_v*	State[a]	Cluster[b]	Ref.**
12 350.610	$2111^1 0^0$	{4,19,1,*u*}	halo93a
12 475.139	$2110^0 1^1$	{4,19,1,*g*}	halo93a
12 499.664	$3101^1 0^0$	{4,19,1,*g*}	halo93a
12 541.2	$0408^{0/2} 0^0$	{4,20,0/2,*g*}	jacob98
12 671.479	<25	{3,20,1,*u*}	halo93b
12 671.611	$2020^0 0^0$	{4,20,0,g^+}	halo99
12 675.677	$1030^0 0^0$	{4,20,0,u^+}	halo93b
12 710.011	$0301^1 9^{-1}$	{3,19,0,u^+}	halo93b
12 710.909	<25	{4,20,0,u^+}	halo93b
12 732.791	$0405^1 3^{-1}$	{4,20,0,u^+}	halo93b
12 742.5	$0404^? 2^?$	{4,20,0/2,*g*}	jacob98b
12 761.972	$1214^0 0^0$	{4,20,0,u^+}	halo93b
12 854.027	$1121^1 1^{-1}$	{4,20,0,u^+}	camp97
12 858.225	$1121^1 1^1$	{4,20,2,*u*}	camp97
12 868.681	$0223^1 1^{-1}$	{4,20,0,u^+}	camp97
12 922.052	$2112^0 0^0$	{4,20,0,u^+}	camp97
13 026.170	$1212^0 2^0$	{4,20,0,u^+}	kata92
13 033.291	$3010^0 0^0$	{4,20,0,u^+}	kata92
13 154.6	$0506^{0/2} 0^0$	{5,21,0/2,*g*}	jacob98
13 178.44	$3101^1 1^{-1}$	{4,20,0,u^+}	camp97
13 227.629	$4000^0 0^0$	{4,20,0,g^+}	kata93
13 228.561	$2021^1 0^0$	{4,21,1,*g*}	halo93b
13 229.929	$0505^1 1^{-1}$	{5,21,0,u^+}	camp97
13 231.305	$1031^1 0^0$	{4,21,1,*u*}	camp97
13 294.085	$0317^1 0^0$	{4,21,1,*u*}	camp97
13 370.323	$0225^1 0^0$	{4,21,1,*g*}	halo93b
13 370.383	$2020^0 1^1$	{4,21,1,*u*}	camp97
13 375.304	$1030^0 1^1$	{4,21,1,*g*}	halo93b
13 473.688	$1312^0 0^0$	{5,21,0,u^+}	camp95
13 493.871	$0503^3 3^{-3}$	{5,21,0,u^+}	camp95
13 508.642	$1403^1 1^{-1}$	{5,21,0,u^+}	camp92
13 532.335	$0230^0 0^0$	{5,21,0,u^+}	camp92
13 562.503	$0412^2 2^{-2}$	{5,21,0,u^+}	camp92
13 587.411	$3011^1 0^0$	{4,21,1,*u*}	kata92
13 620.594	$0040^0 1^1$	{4,21,1,*u*}	kata92
13 713.843	$2210^0 0^0$	{5,21,0,u^+}	kata94
13 719.238	$2203^1 2^0$	{4,21,1,*g*}	kata92
13 721.202	$3010^0 1^1$	{4,21,1,*g*}	kata92
13 742.318	$1401^1 3^{-1}$	{5,21,0,u^+}	kata94
13 787.969	$1310^0 2^0$	{5,21,0,u^+}	camp95
14 368.3	$0508^{0/2} 0^0$	{5,23,0/2,*g*}	jacob98b
14 597.107	<25	{5,23,0,u^+}	hall84
14 617.179	$1130^0 0^0$	{5,23,0,u^+}	hall84
14 643.125	$0505^3 3^{-3}$	{5,23,0,u^+}	camp98
14 649.334	$1405^1 1^{-1}$	{5,23,0,u^+}	camp98
14 774.740	$1221^1 1^{-1}$	{5,23,0,u^+}	camp97
14 776.94	$0602^2 3^{-1}$	{6,23,1,*u*}	camp97
14 829.517	$2212^0 0^0$	{5,23,0,u^+}	camp97
14 968.903	$3110^0 0^0$	{5,23,0,u^+}	lehmn83
14 983.5	$0606^{0/2} 0^0$	{6,24,0/2,*g*}	jacob98b
15 155.540	$1131^1 0^0$	{5,24,1,*u*}	camp97
15 181.8	$0506^4 3^{-3}$	{5,24,1,*u*}	camp97
15 303.224	$2120^0 1^1$	{5,24,1,*u*}	camp98
15 600.188	$2030^0 0^0$	{5,25,0,u^+}	camp98
15 600.71	$1040^0 0^0$	{5,25,0,g^+}	camp98
15 690.091	$1132^0 0^0$	{5,25,0,u^+}	camp98
15 719.691	$0418^0 0^0$	{5,25,0,u^+}	camp98
15 768.608	$0418^0 0^0$	{5,25,0,u^+}	camp98
15 829.427	<25	{5,25,0,u^+}	camp98
15 845.756	$2121^1 1^{-1}$	{5,25,0,u^+}	camp98
15 948.519	$0050^0 0^0$	{5,25,0,u^+}	camp98
15 983.514	$1130^0 2^0$	{5,25,0,u^+}	camp98
16 070.612	$0422^0 1^1$	{6,25,1,*u*}	camp98
16 139.100	$2031^1 0^0$	{5,26,1,*u*}	camp98
16 139.46	$1041^1 0^0$	{5,26,1,*g*}	camp98

TABLE 5. Assigned experimental states in $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$, with dominant assignment indicated in terms of the normal mode quantum numbers—Continued

G_v*	State[a]	Cluster[b]	Ref.**
16 203.519	4010^00^0	$\{5,25,0,u^+\}$	camp98
16 292.225	2030^01^1	$\{5,26,1,g\}$	camp98
16 292.726	1040^01^1	$\{5,26,1,u\}$	camp98
16 501.132	1505^11^{-1}	$\{6,26,0,u^+\}$	camp98
16 529.728	1414^00^0	$\{6,26,0,u^+\}$	camp98
16 541.186	1230^00^0	$\{6,26,0,u^+\}$	camp98
16 566.120	0332^00^0	$\{6,26,0,u^+\}$	camp98
16 678.114	1321^11^{-1}	$\{6,26,0,u^+\}$	camp98
16 823.535	0512^24^{-2}	$\{6,26,0,u^+\}$	camp98
16 888.760	3210^00^0	$\{6,26,0,u^+\}$	camp98
17 518.804	2130^00^0	$\{6,28,0,u^+\}$	halo91
17 535.946	0607^13^{-1}	$\{6,28,0,u^+\}$	halo91
17 581.515	1232^00^0	$\{6,28,0,u^+\}$	camp97
17 622.709	1232^00^0	$\{6,28,0,u^+\}$	camp97
17 664.14	2314^00^0	$\{6,28,0,u^+\}$	camp97
17 879.220	0150^00^0	$\{6,28,0,u^+\}$	camp97
18 045.723	2131^10^0	$\{6,29,1,u\}$	camp97
18 208.656	2130^01^1	$\{6,29,1,g\}$	halo91
18 334.680	1514^00^0	$\{7,29,0,u^+\}$	camp97
18 337.39	0614^22^{-2}	$\{7,29,0,u^+\}$	camp97
18 430.066	3030^00^0	$\{6,30,0,u^+\}$	lehm83
18 430.284	2040^00^0	$\{6,30,0,g^+\}$	sriv00
18 915.394[e]	1050^00^0	$\{6,30,0,u^+\}$	hall84

[a]Dominant zero-order eigenfunctions $(v_1,v_2,v_3,v_4^{l_4},v_5^{l_5})$ in the composition of the wavefunction of the observed level. Only dominant states with a fraction higher than 25%, as calculated by the Cluster model, are mentioned (see text). It happens that the same basis state is dominant for more than one vibrational eigenstate.

[b]The clusters are labeled by the triplet of quantum numbers: $\{N_s=v_1+v_2+v_3,\ N_r=5v_1+3v_2+5v_3+v_4+v_5,\ k=l_4+l_5,\ u/g$ symmetry$\}$.

[c]The value 5068.0 cm^{-1} is listed in Hoshina *et al.* (hoshi01).[33]

[d]An alternative value of 6460.96 cm^{-1} is listed in Table III of the same reference by Hoshina *et al.* (hoshi01).[33]

[e]Six higher energy additional states are reported by Hall (hall84),[56] up to 20 394.396 cm^{-1}.

*A number of *ungerade* states have been observed in IR–UV–DF spectra (hoshi01: Table VII) both *via* the $2\nu_3'+\nu_6'$ and $3\nu_3'+\nu_6'$ vibrational states of the $\tilde{A}\,^1A_u$ state. The average value of the two vibrational energies is then listed. An additional state, not listed in the table, was reported at 10 951.930 cm^{-1} in herm89 (Herman *et al.*[61]), and possibly misassigned in that reference.

**Refs: abbo96a: Abbouti Temsamani and Herman;[38] abbo96b: Abbouti Temsamani *et al.*;[37] bald72: Baldacci *et al.*;[50] bald77: Baldacci *et al.*;[51] berm98: Bermejo *et al.*;[52] berm99: Bermejo *et al.*;[53] camp92: Campargue *et al.*;[54] camp95: Campargue *et al.*;[39] camp97: Campargue *et al.*;[40] camp98: Campargue *et al.*;[42] dcun91: D'Cunha *et al.*;[55] ding02: Ding *et al.*;[45] elid99: El Idrissi *et al.*;[30] hall84: Hall;[56] halo91: Zhan *et al.*;[57] halo93a: Zhan *et al.*;[58] halo93b: Zhan *et al.*;[59] halo99: Saarinen *et al.*;[60] herm89: Herman *et al.*;[61] herm91: Herman *et al.*;[62] hoshi01: Hoshina *et al.*;[33] jacob98a: Jacobson *et al.*;[34] jacob98b: Jacobson *et al.*;[49] jona92: Jonas *et al.*;[63] jona93: Jonas *et al.*;[48] kabb91: Kabbadj *et al.*;[25] kata92: Sakai and Katayama;[64] kata93: Sakai and Katayama;[65] kata94: Sakai *et al.*;[66] kepp96: Keppler *et al.*;[67] kou94: Kou *et al.*;[36] laff90: Lafferty and Pine;[68] lehm83: Scherer *et al.*:[69] mets01: Metsälä *et al.*;[70] obrien98: O'Brien *et al.*;[46] palm72: Palmer *et al.*;[71] pliv72: Plíva;[72,73] plyl63: Plyler *et al.*;[9] rins82: Rinsland *et al.*;[74] sini80: Sinitsa;[75] smit88: Smith and Winn;[76] solina96: Solina *et al.*;[47] sriv00: Srivastava *et al.*;[77] tolo92: Tolonen and Alanko;[78] vand93: Vander Auwera *et al.*;[20] weir01: Weirauch *et al.*[44]

TABLE 6. Assigned experimental states in $^{12}C_2D_2$, $\tilde{X}\ ^1\Sigma_g^+$, with dominant assignment indicated in terms of the normal mode quantum numbers. The symmetry and vibrational angular momentum $k=l_4+l_5$ of the state is provided, together with the vibrational energy, G_v in cm^{-1}. The reference given corresponds to the most reliable experimental observation. The vibrational term values of the pure bending levels were calculated from the results given in Huet *et al.* (huet91)[28]

G_v	State[a]	Cluster[b]	Ref.*
511.532	$0001^1 0^0$	$\{0,1,1,g\}$	huet91
538.636	$0000^0 1^1$	$\{0,1,1,u\}$	huet91
1 024.81	$0002^0 0^0$	$\{0,2,0,g^+\}$	huet91
1 027.62	$0002^2 0^0$	$\{0,2,2,g\}$	huet91
1 041.49	$0001^1 1^{-1}$	$\{0,2,0,u^+\}$	huet91
1 048.66	$0001^{-1} 1^1$	$\{0,2,0,u^-\}$	huet91
1 051.78	$0001^1 1^1$	$\{0,2,2,u\}$	huet91
1 070.86	$0000^0 2^0$	$\{0,2,0,g^+\}$	huet91
1 078.54	$0000^0 2^2$	$\{0,2,2,g\}$	huet91
1 552.75	$0002^2 1^{-1}$	$\{0,3,1,u\}$	huet91
1 562.43	$0002^0 1^1$	$\{0,3,1,u\}$	huet91
1 569.44	$0002^2 1^1$	$\{0,3,3,u\}$	huet91
1 574.82	$0001^{-1} 2^2$	$\{0,3,1,g\}$	huet91
1 585.38	$0001^{-1} 2^2$	$\{0,3,1,g\}$	huet91
1 593.49	$0001^1 2^2$	$\{0,3,3,g\}$	huet91
1 604.54	$0000^0 3^1$	$\{0,3,1,u\}$	huet91
1 619.74	$0000^0 3^3$	$\{0,3,3,u\}$	huet91
1 764.796	$0100^0 0^0$	$\{1,0,0,g^+\}$	kost80
2 136.21	$0000^0 4^2$	$\{0,4,2,g\}$	tall54
2 136.81	$0000^0 4^0$	$\{0,4,0,g\}$	tall54
2 659.35	$0000^0 5^1$	$\{0,4,1,g\}$	tall54
2 272.401	$0101^1 0^0$	$\{1,1,1,g\}$	berm01
2 305.079	$0100^0 1^1$	$\{1,1,1,u\}$	berm01
2 439.244	$0010^0 0^0$	$\{1,0,0,u^+\}$	gher68
2 705.160	$1000^0 0^0$	$\{1,0,0,g^+\}$	alan87
2 783.132	$0102^0 0^0$	$\{1,2,0,g^+\}$	berm01
2 784.755	$0102^2 0^0$	$\{1,2,2,g\}$	berm01
2 803.959	$0101^1 1^{-1}$	$\{1,2,0,u^+\}$	berm01
2 811.050	$0101^{-1} 1^1$	$\{1,2,0,u^-\}$	berm01
2 814.122	$0101^1 1^1$	$\{1,2,2,u\}$	berm01
2 838.692	$0100^0 2^0$	$\{1,2,0,g^+\}$	berm01
2 846.491	$0100^0 2^2$	$\{1,2,2,g\}$	berm01
2 945.17	$0011^1 0^0$	$\{1,1,1,u\}$	gher71
2 972.70	$0010^0 1^1$	$\{1,1,1,g\}$	bald72
3 201.98	$1001^1 0^0$	$\{1,1,1,g\}$	gher68b
3 235.61	$1000^0 1^1$	$\{1,1,1,u\}$	gher71
3 452.35	$0012^0 0^0$	$\{1,2,0,u^+\}$	hurl71
3 455.60	$0012^2 0^0$	$\{1,2,2,u\}$	hurl71
3 469.417	$0011^1 1^{-1}$	$\{1,2,0,g^+\}$	gher68
3 480.776	$0011^1 1^1$	$\{1,2,2,g\}$	gher68
3 499.72	$0010^0 2^0$	$\{1,2,0,u^+\}$	gher68
3 507.286	$0010^0 2^2$	$\{1,2,2,u\}$	gher68
3 520.812	$0200^0 0^0$	$\{2,0,0,g^+\}$	berm01
3 733.84	$1001^1 1^1$	$\{1,2,2,u\}$	gher68b
3 759.38	$1000^0 2^0$	$\{1,2,0,g^+\}$	bald72
3 767.30	$1000^0 2^2$	$\{1,2,2,g\}$	bald72
3 965.21	$0013^1 0^0$	$\{1,3,1,u\}$	gher68b
3 970.63	$0013^3 0^0$	$\{1,3,3,u\}$	gher68b
4 190.638	$0110^0 0^0$	$\{2,0,0,u^+\}$	hurl71
4 284.75	$1000^0 3^1$	$\{1,3,1,u\}$	tall54
4 692.77	$0111^1 0^0$	$\{2,1,1,u\}$	gher71
4 725.68	$0110^0 1^1$	$\{2,1,1,g\}$	bald72
4 848.786	$0020^0 0^0$	$\{2,0,0,g^+\}$	tall54
5 097.195	$1010^0 0^0$	$\{2,0,0,u^+\}$	hurl71
5 197.800	$0112^0 0^0$	$\{2,2,0,u^+\}$	herm98
5 199.594	$0112^2 0^0$	$\{2,2,2,u\}$	herm98
5 377.375	$0020^0 1^1$	$\{2,1,1,u\}$	herm98
5 386.456	$2000^0 0^0$	$\{2,0,0,g^+\}$	tall54
5 466.740	$1101^1 1^{-1}$	$\{2,2,0,u^+\}$	herm98
5 587.640	$1011^1 0^0$	$\{2,1,1,u\}$	herm98
5 622.42	$1010^0 1^1$	$\{2,1,1,g\}$	bald72
5 908.457	$2000^0 1^1$	$\{2,1,1,u\}$	herm98

TABLE 6. Assigned experimental states in $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$, with dominant assignment indicated in terms of the normal mode quantum numbers—Continued

G_v	State[a]	Cluster[b]	Ref.*
5 960.13	$1102^2 1^{-1}$	{2,3,1,u}	herm98
5 970.176	$1102^0 1^1$	{2,3,1,u}	herm98
6 080.673	$1012^0 0^0$	{2,2,0,u^+}	herm98
6 083.113	$1012^2 0^0$	{2,2,2,u}	herm98
6381.287	$2001^1 1^{-1}$	{2,2,0,u^+}	herm98
6 828.141	$1110^0 0^0$	{3,0,0,u^+}	herm98
6 933.483	$0212^0 0^0$	{3,2,0,u^+}	herm98
7 230.036	$0030^0 0^0$	{3,0,0,u^+}	herm94
7 314.547	$1111^1 0^0$	{3,1,1,u}	herm98
7 354.907	$1110^0 1^1$	{3,1,1,g}	herm98
7 636.332	$2100^0 1^1$	{3,1,1,u}	herm98
7 724.139	$0031^1 0^0$	{3,1,1,u}	herm94
7 734.003	$2010^0 0^0$	{3,0,0,u^+}	herm94
7 805.520	$1112^0 0^0$	{3,2,0,u^+}	herm94
7 980.045	$1020^0 1^1$	{3,1,1,u}	herm94
8 208.694	$2011^1 0^0$	{3,1,1,u}	herm94
8 251.086	$2010^0 1^1$	{3,1,1,g}	herm94
8 550.142	$1210^0 0^0$	{4,0,0,u^+}	herm94
8 952.887	$0130^0 0^0$	{4,0,0,u^+}	herm94
9 443.452	$0131^1 0^0$	{4,1,1,u}	herm94
9 444.438	$2110^0 0^0$	{4,0,0,u^+}	herm94
9 477.105	$0130^0 1^1$	{4,1,1,g}	herm94
9 794.074	$1030^0 0^0$	{4,0,0,u^+}	herm94
9 963.760	$2110^0 1^1$	{4,1,1,u}	sin92
10 263.053	$1310^0 0^0$	{5,0,0,u^+}	weir01
10 272.390	$1031^1 0^0$	{4,1,1,u}	weir01
10 347.958	$3010^0 0^0$	{4,0,0,u^+}	weir01
10 392.930	$2112^0 0^0$	{4,2,0,u^+}	weir01
10 666.903	$0230^0 0^0$	{5,0,0,u^+}	weir01
10 806.825	$3011^1 0^0$	{4,1,1,u}	weir01
10 857.136	$3010^0 1^1$	{4,1,1,u}	weir01
11 140.448[c]	$1123^1 1^1$	{4,4,2,u}	weir01
11 146.073	$2210^0 0^0$	{5,0,0,u^+}	weir01
11 153.635	$0231^1 0^0$	{5,1,1,u}	weir01
11 192.516	$0230^0 1^1$	{5,1,1,u}	weir01
11 226.127	$1310^0 0^0$	{5,2,0,u^+}	weir01
11 492.716	$1130^0 0^0$	{5,0,0,u^+}	weir01
11 612.453	$2211^1 0^0$	{5,1,1,u}	weir01
11 643.827	$0232^0 0^0$	{5,0,0,u^+}	weir01
11 666.799	$2210^0 1^1$	{5,1,1,u}	weir01
11 905.369	$0050^0 0^0$	{5,0,0,u^+}	pisa93
11 966.67	$1410^0 0^0$	{6,0,0,u^+}	weir01
11 967.350	$1131^1 0^0$	{5,1,1,u}	weir01
12 008.832	$1130^0 1^1$	{5,1,1,u}	weir01
12 036.946	$3110^0 0^0$	{5,0,0,u^+}	weir01
12 037.052[c]	$2021^1 3^1$	{4,4,2,u}	weir01
12 080.444[e]	$0321^1 1^{-1}$	{5,4,0,u^+}	weir01
12 091.102	$2212^0 0^0$	{5,0,0,u^+}	weir01
12 344.534	$2030^0 0^0$	{5,0,0,u^+}	weir01
12 386.560	$0051^1 0^0$	{5,1,1,u}	gros95
12 416.624	$0050^0 1^1$	{5,1,1,g}	gros95
12 491.517	$3111^1 0^0$	{5,1,1,u}	weir01
12 547.862	$3110^0 1^1$	{5,1,1,u}	weir01
12 806.742	$2031^1 0^0$	{5,1,1,u}	gros95
12 851.205	$2030^0 1^1$	{5,1,1,g}	gros95
12 854.240[d]	$1222^{-2} 2$	{5,4,0,g^-}	gros95
12 934.437	$4010^0 0^0$	{5,0,0,u^+}	herm98
12 962.052	$3112^0 0^0$	{5,2,0,u^+}	herm98
13 181.997	$1230^0 0^0$	{6,0,0,u^+}	herm98
13 597.58	$0150^0 0^0$	{6,0,0,u^+}	herm98
13 699.412	$1230^0 1^1$	{6,1,1,g}	herm98
13 717.309	$3210^0 0^0$	{6,0,0,u^+}	herm98
13 768.982	$2312^0 0^0$	{6,2,0,u^+}	herm98
14 019.722	$2130^0 0^0$	{6,0,0,u^+}	herm98
14 075.271	$0151^1 0^0$	{6,1,1,u}	herm98

TABLE 6. Assigned experimental states in $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$, with dominant assignment indicated in terms of the normal mode quantum numbers—Continued

G_v	State[a]	Cluster[b]	Ref.*
14 377.736	1050^00^0	$\{6,0,0,u^+\}$	herm98
14 478.201	2131^10^0	$\{6,1,1,u\}$	herm98
14 527.830	2130^01^1	$\{6,1,1,g\}$	herm98
14 861.293	1330^00^0	$\{7,0,0,u^+\}$	herm98
14 878.400	3030^00^0	$\{6,0,0,u^+\}$	herm98
15 280.616	0250^00^0	$\{7,0,0,u^+\}$	herm98
15 685.433	2230^00^0	$\{7,0,0,u^+\}$	herm98
16 041.042	1150^00^0	$\{7,0,0,u^+\}$	herm98
16 536.970	3130^00^0	$\{7,0,0,u^+\}$	herm98
17 694.211	1250^00^0	$\{8,0,0,u^+\}$	hall84

[a]Dominant zero-order eigenfunctions ($v_1,v_2,v_3,v_4^{l_4},v_5^{l_5}$) in the composition of the wavefunction of the observed level. Only the dominant state corresponding to the largest fraction, as calculated by the Cluster model, is given (see text).

[b]The clusters are labeled by the triplet of quantum numbers: $\{N_s=v_1+v_2+v_3,\ N_b=v_4+v_5,\ k=l_4+l_5,\ u/g$ symmetry$\}$.

[c]State observed through a rotational perturbation. Tentative vibrational assignment.

[d]State observed through a Coriolis perturbation.

[e]Very tentative vibrational assignment.

*Refs: alan87: Alanko *et al.*;[79] alle56: Allen *et al.*;[80] bald72: Baldacci *et al.*;[81] fast72: Fast and Welsh;[7] gher68: Ghersetti *et al.*;[82] gher68b: Ghersetti *et al.*;[83] gher71: Ghersetti *et al.*;[27] gros95: Grosskloss *et al.*;[84] hall84: Hall;[56] herm94: Herman *et al.*;[85] herm97: Herman *et al.*;[31] huet91: Huet *et al.*;[28] huha79: Huhanantti *et al.*;[86] hurl71: Hurlock *et al.*;[87] kost80: Kostyk and Welsh;[5] laff77: Lafferty *et al.*;[88] over55: Overend and Thompson;[89] palm69: Palmer *et al.*;[90] pisa93: Pisarchik *et al.*;[91] saks52: Saksena;[92] tall54: Talley and Nielsen;[93] tidw62: Tidwell and Plyler;[94] sini92: Sinitsa.[95]

TABLE 7. Assigned experimental states in $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$, with dominant assignment indicated in terms of the normal mode quantum numbers. The symmetry and vibrational angular momentum $k=l_4+l_5$ of the state is provided, together with the vibrational energy, G_v in cm^{-1}. The reference given corresponds to the most reliable experimental observation. Additional states of Σ_u^+ symmetry are reported in the literature, at 15 531.955 cm^{-1} by Scherer *et al.* (sche83),[69] and 23 670.124 and 23 671.125 cm^{-1} by Hall (hall84),[56] which are not listed in the table because not fully assigned

G_v	State[a]	Cluster[b]	Ref.*
603.888	0001^10^0	{0,1,1,g}	dilo93
728.352	0000^01^1	{0,1,1,u}	dilo93
1 212.25	0002^00^0	{0,2,0,g^+}	dilo93
1 215.46	0002^20^0	{0,2,2,g}	dilo93
1 317.239	0001^11^{-1}	{0,2,0,u^+}	dilo93
1 329.611	$0001^{-1}1^1$	{0,2,0,u^-}	dilo93
1 336.656	0001^11^1	{0,2,2,u}	dilo93
1 445.29	0000^02^0	{0,2,0,g^+}	dilo93
1 459.038	0000^02^2	{0,2,2,g}	dilo93
1 828.406	0003^10^0	{0,3,1,g}	venu99
1 834.777	0003^30^0	{0,3,3,g}	venu99
1 910.667	0100^00^0	{1,3,0,g^+}	dilo94
1 921.337	0002^21^{-1}	{0,3,1,u}	venu99
1 940.924	0002^01^1	{0,3,1,u}	venu99
1 952.724	0002^21^1	{0,3,3,u}	venu99
2 036.403	0001^12^0	{0,3,1,g}	venu99
2 054.138	$0001^{-1}2^2$	{0,3,1,g}	venu99
2 072.045	0001^12^2	{0,3,3,g}	venu99
2 164.654	0000^03^1	{0,3,1,u}	venu99
2 192.1	0000^03^3	{0,3,3,u}	venu99
2 448.74	0004^00^0	{0,4,0,g^+}	becu98
2 502.317	0101^10^0	{1,4,1,g}	dilo94
2 531.614	0003^11^{-1}	{0,4,0,u^+}	venu99
2 532.578	0003^31^{-1}	{0,4,2,u}	venu99
2 626.433	0002^22^{-2}	{0,4,0,g^+}	venu99
2 637.218[c]	0100^01^1	{1,4,1,u}	dilo94
2 639.458	$0002^{-2}2^2$	{0,4,0,g^-}	venu99
2 644.591	0002^22^0	{0,4,2,g}	venu99
2 743.421	0001^13^{-1}	{0,4,0,u^+}	venu99
2 758.685	0001^13^1	{0,4,2,u}	venu99
2 872.791	0000^04^0	{0,4,0,g^+}	venu99
2 886.489	0000^04^2	{0,4,2,g}	venu99
3 098.25	0102^00^0	{1,5,0,g^+}	becu98
3 213.395	0101^11^{-1}	{1,5,0,u^+}	dilo94
3 226.08	$0101^{-1}1^1$	{1,5,0,u^-}	albo95
3 233.232	0101^11^1	{1,5,2,u}	albo95
3 279.482	0010^00^0	{1,5,0,u^+}	albo95
3 347.683	1000^00^0	{1,5,0,g^+}	dilo94
3 354.417	0100^02^0	{1,5,0,g^+}	dilo94
3 366.027	0100^02^2	{1,5,2,g}	dilo94
3 807.445	0200^00^0	{2,6,0,g^+}	berm99
3 825.934	0102^01^1	{1,6,1,u}	fusi99
3 873.727	0011^10^0	{1,6,1,u}	fusi99
3 929.614	0101^12^0	{1,6,1,g}	venu95
3 940.232	1001^10^0	{1,6,1,g}	venu95
4 000.057	0010^01^1	{1,6,1,g}	venu95
4 064.263[c]	1000^01^1	{1,6,1,u}	venu95
4 073.312[c]	0100^03^1	{1,6,1,u}	venu95
4 405.114	0103^11^{-1}	{1,7,0,u^+}	fusi99
4 472.357	0012^00^0	{1,7,0,u^+}	fusi99
4 475.502	0012^20^0	{1,7,2,u}	fusi99
4 507.807	0102^22^{-2}	{1,7,0,g^+}	fusi99
4 535.008	1002^00^0	{1,7,0,g^+}	fusi99
4 581.506	0011^11^{-1}	{1,7,0,g^+}	fusi99
4 590.885	$0011^{-1}1^1$	{1,7,0,g^-}	fusi99
4 599.228	0011^11^1	{1,7,2,g}	fusi99
4 632.526	0101^13^{-1}	{1,7,0,u^+}	venu95
4 645.566	1001^11^{-1}	{1,7,0,u^+}	venu95
4 649.392[c]	0101^13^1	{1,7,2,u}	venu95
4 653.976	$1001^{-1}1^1$	{1,7,0,u^-}	venu95
4 662.408	1001^11^1	{1,7,2,u}	venu95
4 663.259	$0101^{-1}3^1$	{1,7,0,u^-}	fusi99

TABLE 7. Assigned experimental states in $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$, with dominant assignment indicated in terms of the normal mode quantum numbers —Continued

G_v	State[a]	Cluster[b]	Ref.*
4 708.859	$0010^0 2^0$	$\{1,7,0,u^+\}$	venu95
4 722.996	$0010^0 2^2$	$\{1,7,2,u\}$	venu95
4 768.889	$0100^0 4^0$	$\{1,7,0,g^+\}$	venu95
4 781.483	$1000^0 2^0$	$\{1,7,0,g^+\}$	venu95
4 783.439	$0100^0 4^2$	$\{1,7,2,g\}$	venu95
4 794.652	$1000^0 2^2$	$\{1,7,2,g\}$	venu95
5 078.635	$0013^1 0^0$	$\{1,8,1,u\}$	dilo99
5 095.403	$0201^1 1^{-1}$	$\{2,8,0,u^+\}$	dilo99
5 185.584	$0110^0 0^0$	$\{2,8,0,u^+\}$	dilo99
5 242.478	$0200^0 2^0$	$\{2,8,0,g^+\}$	berm99
5 252.346	$1002^0 1^1$	$\{1,8,1,u\}$	dilo99
5 252.85	$1100^0 0^0$	$\{2,8,0,g^+\}$	berm99
5 476.377	$0100^0 5^1$	$\{1,8,1,u\}$	dilo99
5 491.722	$1000^0 3^1$	$\{1,8,1,u\}$	dilo99
5 688.088	$0014^0 0^0$	$\{1,9,0,u^+\}$	dilo99
5 767.725	$0111^1 0^0$	$\{2,9,1,u\}$	dilo99
6 490.556	$0020^0 0^0$	$\{2,10,0,g^+\}$	dilo99
6 509.974	$0201^1 3^{-1}$	$\{2,10,0,u^+\}$	dilo99
6521.919	$1010^0 0^0$	$\{2,10,0,u^+\}$	naka96
6 526.897	$0201^1 3^1$	$\{2,10,2,u\}$	dilo99
6 535.122	$1101^1 1^{-1}$	$\{2,10,0,u^+\}$	dilo99
6 611.194	$0110^0 2^0$	$\{2,10,0,u^+\}$	dilo99
6 664.951	$2000^0 0^0$	$\{2,10,0,g^+\}$	dilo99
7 077.504	$0210^0 0^0$	$\{3,11,0,u^+\}$	dilo99
7 097.612	$0202^{-2} 3^3$	$\{2,11,1,u\}$	dilo99
7 100.69	$1011^1 0^0$	$\{2,11,1,u\}$	dilo99
7 114.938	$1102^2 1^{-1}$	$\{2,11,1,u\}$	dilo99
7 179.761	$0111^{-1} 2^2$	$\{2,11,1,u\}$	dilo99
7 197.123	$0111^1 2^0$	$\{2,11,1,u\}$	dilo99
7 203.606	$0020^0 1^1$	$\{2,11,1,u\}$	dilo99
7 227.436	$1010^0 1^1$	$\{2,11,1,g\}$	dilo99
7 244.462	$1101^1 2^0$	$\{2,11,1,g\}$	dilo99
7 248.334	$2001^1 0^0$	$\{2,11,1,g\}$	dilo99
7 361.65	$0200^0 5^1$	$\{2,11,1,u\}$	dilo99
7 372.263	$2000^0 1^1$	$\{2,11,1,u\}$	dilo99
7 388.083	$1100^0 3^1$	$\{2,11,1,u\}$	dilo99
7 647.079	$0211^1 0^0$	$\{3,12,1,u\}$	dilo99
8 401.224	$1201^1 1^{-1}$	$\{3,13,0,u^+\}$	dilo99
8 422.926	$1110^0 0^0$	$\{3,13,0,u^+\}$	dilo99
9 539.323	$1203^1 1^{-1}$	$\{3,15,0,u^+\}$	dilo99
9 565.656	$1112^0 0^0$	$\{3,15,0,u^+\}$	dilo99
9 596.358[d]	$1112^2 0^0$	$\{3,15,2,u\}$	dilo99
9 596.358[d]	$1203^1 1^1$	$\{3,15,2,u\}$	dilo99
9 605.325	$0030^0 0^0$	$\{3,15,0,u^+\}$	dilo99
9 612.15	$0212^2 2^{-2}$	$\{3,15,0,u^+\}$	dilo99
9 662.073	$0121^1 1^{-1}$	$\{3,15,0,u^+\}$	dilo99
9 786.347	$2010^0 0^0$	$\{3,15,0,u^+\}$	dilo99
9 797.837	$1201^1 3^{-1}$	$\{3,15,0,u^+\}$	dilo99
9 820.365	$2101^1 1^{-1}$	$\{3,15,0,u^+\}$	dilo99
10 146.545	$1113^1 0^0$	$\{3,16,1,u\}$	dilo99
10 175.628	$0031^1 0^0$	$\{3,16,1,u\}$	dilo99
10 307.685	$0030^0 1^1$	$\{3,16,1,g\}$	dilo99
10 359.9	$2011^1 0^0$	$\{3,16,1,u\}$	dilo99
10 498.939	$2010^0 1^1$	$\{3,16,1,g\}$	dilo99
11 494.81	$0130^0 0^0$	$\{4,18,0,u^+\}$	dilo99
12 609.26	$1030^0 0^0$	$\{4,20,0,u^+\}$	dilo99
12 628.818	$0132^0 0^0$	$\{4,20,0,u^+\}$	dilo99
12 960.293	$3010^0 0^0$	$\{4,20,0,u^+\}$	hall84
15 520.164	$2030^0 0^0$	$\{5,25,0,u^+\}$	sche83
15 573.650	$1132^0 0^0$	$\{5,25,0,u^+\}$	sche83
15 726.724	$2121^1 1^{-1}$	$\{5,25,0,u^+\}$	sche83
15 888.507	$0050^0 0^0$	$\{5,25,0,u^+\}$	sche83
15 892.190	$1130^0 2^0$	$\{5,25,0,u^+\}$	sche83
16 052.881	$2031^1 0^0$	$\{5,26,1,u\}$	sche83
16 368.103	$1230^0 0^0$	$\{6,26,0,u^+\}$	sche83

TABLE 7. Assigned experimental states in $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$, with dominant assignment indicated in terms of the normal mode quantum numbers —Continued

G_v	State[a]	Cluster[b]	Ref.*
17 377.197	2130^00^0	$\{6,28,0,u^+\}$	sche83
17 398.776	2130^00^0	$\{6,28,0,u^+\}$	sche83
18 332.696	3030^00^0	$\{6,30,0,u^+\}$	sche83
18 580.721	2131^11^{-1}	$\{6,30,0,g^+\}$	sriv00
18 846.948	3031^10^0	$\{6,31,1,u\}$	sche83
19 017.37	3030^01^1	$\{6,31,1,g\}$	sche83

[a]Dominant zero-order eigenfunctions ($v_1,v_2,v_3,v_4^{l_4},v_5^{l_5}$) in the composition of the wavefunction of the observed level. Only the dominant state corresponding to the largest fraction, as calculated by the Cluster model, is given (see text).

[b]The clusters are labeled by the triplet of quantum numbers: $\{N_s=v_1+v_2+v_3,\ N_r=5v_1+3v_2+5v_3+v_4+v_5,\ k=l_4+l_5,\ u/g$ symmetry$\}$.

[a]Parameters derived from the *e* symmetry sublevel only.

[d]Two possible assignments are listed.

*Refs: albo95: Alboni *et al.*;[22] becu98: Becucci *et al.*;[96] berm99: Bermejo *et al.*;[53] dilo93: Di Lonardo *et al.*;[26] dilo94: Di Lonardo *et al.*;[21] dilo99: Di Lonardo *et al.*;[97] fusi99: Fusina *et al.*;[98] hall84: Hall;[56] naka96: Nakagawa *et al.*;[99] sche83: Scherer *et al.*;[69] sriv00: Srivastava *et al.*;[77] venu95: Venuti *et al.*;[100] venu99: Venuti *et al.*[101]

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30] Fractions of basis states are mentioned provided they are larger than 25%. Only states with $k=0,1,2$ are printed. The full set of states in the same energy range is available on the WEB site of the Laboratoire de Chimie Physique Moléculaire at the Université libre de Bruxelles (http://www.ulb.ac.be/cpm/)

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
612.7	1.178	1,g	0	0	0	1	1	0	0	0	1	100
730.2	1.179	1,u	0	0	0	0	0	1	1	0	1	100
1 230.8	1.179	0,g^+	0	0	0	2	0	0	0	0	2	100
1 233.0	1.179	2,g	0	0	0	2	2	0	0	0	2	100
1 328.1	1.180	0,u^+	0	0	0	1	1	1	−1	0	2	100
1 339.8	1.180	0,u^-	0	0	0	1	−1	1	1	0	2	100
1 347.6	1.180	2,u	0	0	0	1	1	1	1	0	2	100
1 449.0	1.181	0,g^+	0	0	0	0	0	2	0	0	2	100
1 462.8	1.181	2,g	0	0	0	0	0	2	2	0	2	100
1 856.4	1.181	1,g	0	0	0	3	1	0	0	0	3	100
1 941.1	1.182	1,u	0	0	0	2	2	1	−1	0	3	78
1 960.6	1.182	1,u	0	0	0	2	0	1	1	0	3	78
1 974.3	1.170	0,g^+	0	1	0	0	0	0	0	1	3	100
2 049.2	1.182	1,g	0	0	0	1	1	2	0	0	3	49
		1,g	0	0	0	1	−1	2	2	0	3	51
2 066.5	1.182	1,g	0	0	0	1	1	2	0	0	3	50
		1,g	0	0	0	1	−1	2	2	0	3	49
2 170.1	1.183	1,u	0	0	0	0	0	3	1	0	3	100
2 487.0	1.182	0,g^+	0	0	0	4	0	0	0	0	4	99
2 489.3	1.182	2,g	0	0	0	4	2	0	0	0	4	99
2 560.6	1.183	2,u	0	0	0	3	3	1	−1	0	4	88
2 561.6	1.183	0,u^+	0	0	0	3	1	1	−1	0	4	100
2 574.5	1.172	1,g	0	1	0	1	1	0	0	1	4	100
2 583.7	1.183	0,u^-	0	0	0	3	−1	1	1	0	4	99
2 589.8	1.183	2,u	0	0	0	3	1	1	1	0	4	87
2 648.2	1.184	0,g^+	0	0	0	2	2	2	−2	0	4	66
		0,g^+	0	0	0	2	0	2	0	0	4	34
2 660.3	1.184	0,g^-	0	0	0	2	−2	2	2	0	4	100
2 666.6	1.184	2,g	0	0	0	2	2	2	0	0	4	70
		2,g	0	0	0	2	0	2	2	0	4	30
2 683.8	1.184	0,g^+	0	0	0	2	2	2	−2	0	4	34
		0,g^+	0	0	0	2	0	2	0	0	4	65
2 692.7	1.184	2,g	0	0	0	2	2	2	0	0	4	30
		2,g	0	0	0	2	0	2	2	0	4	69
2 703.0	1.173	1,u	0	1	0	0	0	1	1	1	4	100
2 758.1	1.185	0,u^+	0	0	0	1	1	3	−1	0	4	100
2 773.3	1.185	2,u	0	0	0	1	1	3	1	0	4	48
		2,u	0	0	0	1	−1	3	3	0	4	52
2 783.7	1.185	0,u^-	0	0	0	1	−1	3	1	0	4	99
2 795.4	1.185	2,u	0	0	0	1	1	3	1	0	4	51
		2,u	0	0	0	1	−1	3	3	0	4	48
2 879.9	1.186	0,g^+	0	0	0	0	0	4	0	0	4	99
2 893.7	1.186	2,g	0	0	0	0	0	4	2	0	4	99
3 124.8	1.183	1,g	0	0	0	5	1	0	0	0	5	99
3 180.8	1.173	0,g^+	0	1	0	2	0	0	0	1	5	100
3 183.3	1.173	2,g	0	1	0	2	2	0	0	1	5	100
3 187.4	1.184	1,u	0	0	0	4	2	1	−1	0	5	68
		1,u	0	0	0	4	0	1	1	0	5	31
3 215.8	1.184	1,u	0	0	0	4	2	1	−1	0	5	30
		1,u	0	0	0	4	0	1	1	0	5	68
3 261.5	1.185	1,g	0	0	0	3	3	2	−2	0	5	66
		1,g	0	0	0	3	1	2	0	0	5	26
3 282.2	1.185	1,g	0	0	0	3	3	2	−2	0	5	27
		1,g	0	0	0	3	−1	2	2	0	5	53
3 282.4	1.173	0,u^+	0	0	1	0	0	0	0	1	5	46
		0,u^+	0	1	0	1	1	1	−1	1	5	54
3 295.1	1.172	0,u^+	0	0	1	0	0	0	0	1	5	54
		0,u^+	0	1	0	1	1	1	−1	1	5	46
3 300.0	1.174	0,u^-	0	1	0	1	−1	1	1	1	5	100
3 307.8	1.174	2,u	0	1	0	1	1	1	1	1	5	100
3 311.4	1.185	1,g	0	0	0	3	1	2	0	0	5	53
		1,g	0	0	0	3	−1	2	2	0	5	38

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
3 360.3	1.186	1,*u*	0	0	0	2	2	3	−1	0	5	33
		1,*u*	0	0	0	2	0	3	1	0	5	38
		1,*u*	0	0	0	2	−2	3	3	0	5	29
3 372.4	1.170	0,g^+	1	0	0	0	0	0	0	1	5	99
3 378.6	1.186	1,*u*	0	0	0	2	2	3	−1	0	5	43
		1,*u*	0	0	0	2	−2	3	3	0	5	56
3 408.2	1.186	1,*u*	0	0	0	2	0	3	1	0	5	59
3 420.5	1.175	0,g^+	0	1	0	0	0	2	0	1	5	99
3 434.1	1.175	2,*g*	0	1	0	0	0	2	2	1	5	100
3 470.3	1.187	1,*g*	0	0	0	1	1	4	0	0	5	49
		1,*g*	0	0	0	1	−1	4	2	0	5	50
3 503.0	1.187	1,*g*	0	0	0	1	1	4	0	0	5	50
		1,*g*	0	0	0	1	−1	4	2	0	5	48
3 592.1	1.188	1,*u*	0	0	0	0	0	5	1	0	5	99
3 767.0	1.185	0,g^+	0	0	0	6	0	0	0	0	6	97
3 769.4	1.185	2,*g*	0	0	0	6	2	0	0	0	6	98
3 795.4	1.175	1,*g*	0	1	0	3	1	0	0	1	6	99
3 819.3	1.186	0,u^+	0	0	0	5	1	1	−1	0	6	98
3 819.4	1.186	2,*u*	0	0	0	5	3	1	−1	0	6	78
3 850.3	1.186	0,u^-	0	0	0	5	−1	1	1	0	6	96
3 855.6	1.186	2,*u*	0	0	0	5	1	1	1	0	6	77
3 880.4	1.187	2,*g*	0	0	0	4	4	2	−2	0	6	79
3 882.6	1.174	1,*u*	0	0	1	1	1	0	0	1	6	44
		1,*u*	0	1	0	2	2	1	−1	1	6	42
3 884.0	1.187	0,g^+	0	0	0	4	2	2	−2	0	6	60
		0,g^+	0	0	0	4	0	2	0	0	6	38
3 898.4	1.174	1,*u*	0	0	1	1	1	0	0	1	6	55
		1,*u*	0	1	0	2	2	1	−1	1	6	39
3 906.2	1.187	0,g^-	0	0	0	4	−2	2	2	0	6	98
3 909.1	1.175	1,*u*	0	1	0	2	0	1	1	1	6	80
3 911.5	1.187	2,*g*	0	0	0	4	2	2	0	0	6	38
		2,*g*	0	0	0	4	0	2	2	0	6	42
3 933.8	1.164	0,g^+	0	2	0	0	0	0	0	2	6	100
3 940.3	1.187	0,g^+	0	0	0	4	2	2	−2	0	6	37
		0,g^+	0	0	0	4	0	2	0	0	6	56
3 947.4	1.187	2,*g*	0	0	0	4	2	2	0	0	6	39
		2,*g*	0	0	0	4	0	2	2	0	6	52
3 960.8	1.187	0,u^+	0	0	0	3	3	3	−3	0	6	49
		0,u^+	0	0	0	3	1	3	−1	0	6	50
3 969.8	1.171	1,*g*	1	0	0	1	1	0	0	1	6	94
3 973.5	1.187	0,u^-	0	0	0	3	−3	3	3	0	6	90
3 978.1	1.187	2,*u*	0	0	0	3	3	3	−1	0	6	53
		2,*u*	0	0	0	3	1	3	1	0	6	34
3 996.9	1.187	0,u^+	0	0	0	3	3	3	−3	0	6	51
		0,u^+	0	0	0	3	1	3	−1	0	6	46
4 002.5	1.175	1,*g*	0	0	1	0	0	1	1	1	6	35
		1,*g*	0	1	0	1	1	2	0	1	6	26
		1,*g*	0	1	0	1	−1	2	2	1	6	35
4 005.7	1.187	2,*u*	0	0	0	3	3	3	−1	0	6	34
		2,*u*	0	0	0	3	−1	3	3	0	6	55
4 017.0	1.174	1,*g*	0	0	1	0	0	1	1	1	6	59
		1,*g*	0	1	0	1	1	2	0	1	6	29
4 025.3	1.176	1,*g*	0	1	0	1	1	2	0	1	6	44
		1,*g*	0	1	0	1	−1	2	2	1	6	54
4 032.7	1.187	0,u^-	0	0	0	3	−1	3	1	0	6	82
4 041.5	1.187	2,*u*	0	0	0	3	1	3	1	0	6	52
		2,*u*	0	0	0	3	−1	3	3	0	6	31
4 060.0	1.188	0,g^+	0	0	0	2	2	4	−2	0	6	59
		0,g^+	0	0	0	2	0	4	0	0	6	40
4 076.0	1.188	2,*g*	0	0	0	2	2	4	0	0	6	32
		2,*g*	0	0	0	2	0	4	2	0	6	40
		2,*g*	0	0	0	2	−2	4	4	0	6	27
4 086.9	1.188	0,g^-	0	0	0	2	−2	4	2	0	6	98
4 092.2	1.172	1,*u*	1	0	0	0	0	1	1	1	6	99

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
4 099.7	1.188	2,*g*	0	0	0	2	2	4	0	0	6	40
		2,*g*	0	0	0	2	−2	4	4	0	6	58
4 124.6	1.188	0,g^+	0	0	0	2	2	4	−2	0	6	39
		0,g^+	0	0	0	2	0	4	0	0	6	54
4 135.1	1.188	2,*g*	0	0	0	2	0	4	2	0	6	55
4 140.3	1.177	1,*u*	0	1	0	0	0	3	1	1	6	99
4 170.8	1.189	0,u^+	0	0	0	1	1	5	−1	0	6	98
4 185.4	1.189	2,*u*	0	0	0	1	1	5	1	0	6	47
		2,*u*	0	0	0	1	−1	5	3	0	6	51
4 212.8	1.189	0,u^-	0	0	0	1	−1	5	1	0	6	96
4 224.9	1.189	2,*u*	0	0	0	1	1	5	1	0	6	50
		2,*u*	0	0	0	1	−1	5	3	0	6	47
4 293.1	1.190	0,g^+	0	0	0	0	0	6	0	0	6	98
4 306.8	1.190	2,*g*	0	0	0	0	0	6	2	0	6	98
4 415.6	1.176	0,g^+	0	1	0	4	0	0	0	1	7	98
4 415.9	1.186	1,*g*	0	0	0	7	1	0	0	0	7	96
4 418.2	1.176	2,*g*	0	1	0	4	2	0	0	1	7	99
4 456.7	1.187	1,*u*	0	0	0	6	2	1	−1	0	7	62
		1,*u*	0	0	0	6	0	1	1	0	7	34
4 489.3	1.175	0,u^+	0	0	1	2	0	0	0	1	7	48
		0,u^+	0	1	0	3	1	1	−1	1	7	51
4 490.7	1.175	2,*u*	0	0	1	2	2	0	0	1	7	41
		2,*u*	0	1	0	3	3	1	−1	1	7	49
4 492.7	1.187	1,*u*	0	0	0	6	2	1	−1	0	7	33
		1,*u*	0	0	0	6	0	1	1	0	7	60
4 508.7	1.175	0,u^+	0	0	1	2	0	0	0	1	7	51
		0,u^+	0	1	0	3	1	1	−1	1	7	49
4 509.1	1.175	2,*u*	0	0	1	2	2	0	0	1	7	58
		2,*u*	0	1	0	3	3	1	−1	1	7	40
4 509.9	1.188	1,*g*	0	0	0	5	3	2	−2	0	7	52
		1,*g*	0	0	0	5	1	2	0	0	7	32
4 521.0	1.166	1,*g*	0	2	0	1	1	0	0	2	7	100
4 521.0	1.177	0,u^-	0	1	0	3	−1	1	1	1	7	99
4 527.3	1.177	2,*u*	0	1	0	3	1	1	1	1	7	87
4 538.5	1.188	1,*g*	0	0	0	5	3	2	−2	0	7	35
		1,*g*	0	0	0	5	−1	2	2	0	7	52
4 570.0	1.173	0,g^+	1	0	0	2	0	0	0	1	7	70
4 574.5	1.189	1,*u*	0	0	0	4	4	3	−3	0	7	58
		1,*u*	0	0	0	4	2	3	−1	0	7	26
4 575.3	1.173	2,*g*	1	0	0	2	2	0	0	1	7	90
4 577.7	1.188	1,*g*	0	0	0	5	1	2	0	0	7	48
		1,*g*	0	0	0	5	−1	2	2	0	7	31
4 589.8	1.176	0,g^+	0	1	0	2	2	2	−2	1	7	40
4 595.9	1.189	1,*u*	0	0	0	4	4	3	−3	0	7	29
		1,*u*	0	0	0	4	0	3	1	0	7	29
		1,*u*	0	0	0	4	−2	3	3	0	7	35
4 599.3	1.176	0,g^-	0	0	1	1	−1	1	1	1	7	43
		0,g^-	0	1	0	2	−2	2	2	1	7	57
4 608.1	1.176	2,*g*	0	0	1	1	1	1	1	1	7	28
		2,*g*	0	1	0	2	2	2	0	1	7	42
4 609.3	1.175	0,g^+	0	0	1	1	1	1	−1	1	7	60
4 617.5	1.176	0,g^-	0	0	1	1	−1	1	1	1	7	57
		0,g^-	0	1	0	2	−2	2	2	1	7	43
4 625.1	1.175	2,*g*	0	0	1	1	1	1	1	1	7	62
		2,*g*	0	1	0	2	2	2	0	1	7	31
4 625.4	1.189	1,*u*	0	0	0	4	2	3	−1	0	7	36
		1,*u*	0	0	0	4	−2	3	3	0	7	45
4 630.4	1.178	0,g^+	0	1	0	2	2	2	−2	1	7	34
		0,g^+	0	1	0	2	0	2	0	1	7	64
4 639.6	1.178	2,*g*	0	1	0	2	2	2	0	1	7	26
		2,*g*	0	1	0	2	0	2	2	1	7	71
4 660.9	1.167	1,*u*	0	2	0	0	0	1	1	2	7	100
4 664.2	1.190	1,*g*	0	0	0	3	1	4	0	0	7	30
		1,*g*	0	0	0	3	−1	4	2	0	7	26

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
4 666.6	1.189	1,u	0	0	0	4	0	3	1	0	7	46
4 673.8	1.174	0,u^+	1	0	0	1	1	1	−1	1	7	90
4 683.9	1.190	1,g	0	0	0	3	3	4	−2	0	7	35
		1,g	0	0	0	3	−3	4	4	0	7	52
4 688.1	1.173	0,u^-	1	0	0	1	−1	1	1	1	7	99
4 692.7	1.174	2,u	1	0	0	1	1	1	1	1	7	89
4 710.8	1.177	0,u^+	0	0	1	0	0	2	0	1	7	26
		0,u^+	0	1	0	1	1	3	−1	1	7	66
4 713.4	1.190	1,g	0	0	0	3	3	4	−2	0	7	29
		1,g	0	0	0	3	−1	4	2	0	7	25
		1,g	0	0	0	3	−3	4	4	0	7	26
4 725.7	1.177	2,u	0	0	1	0	0	2	2	1	7	27
		2,u	0	1	0	1	1	3	1	1	7	26
		2,u	0	1	0	1	−1	3	3	1	7	39
4 727.3	1.176	0,u^+	0	0	1	0	0	2	0	1	7	67
		0,u^+	0	1	0	1	1	3	−1	1	7	31
4 740.8	1.178	0,u^-	0	1	0	1	−1	3	1	1	7	99
4 741.3	1.176	2,u	0	0	1	0	0	2	2	1	7	61
		2,u	0	1	0	1	1	3	1	1	7	29
4 752.9	1.178	2,u	0	1	0	1	1	3	1	1	7	43
		2,u	0	1	0	1	−1	3	3	1	7	52
4 756.1	1.190	1,g	0	0	0	3	1	4	0	0	7	40
		1,g	0	0	0	3	−1	4	2	0	7	34
4 763.6	1.190	1,u	0	0	0	2	2	5	−1	0	7	28
		1,u	0	0	0	2	0	5	1	0	7	41
		1,u	0	0	0	2	−2	5	3	0	7	28
4 798.2	1.190	1,u	0	0	0	2	2	5	−1	0	7	45
		1,u	0	0	0	2	−2	5	3	0	7	51
4 800.2	1.174	0,g^+	1	0	0	0	0	2	0	1	7	98
4 814.3	1.174	2,g	1	0	0	0	0	2	2	1	7	98
4 843.4	1.190	1,u	0	0	0	2	0	5	1	0	7	50
4 848.9	1.179	0,g^+	0	1	0	0	0	4	0	1	7	98
4 862.5	1.179	2,g	0	1	0	0	0	4	2	1	7	98
4 874.4	1.191	1,g	0	0	0	1	1	6	0	0	7	48
		1,g	0	0	0	1	−1	6	2	0	7	50
4 925.3	1.191	1,g	0	0	0	1	1	6	0	0	7	47
		1,g	0	0	0	1	−1	6	2	0	7	46
4 996.7	1.192	1,u	0	0	0	0	0	7	1	0	7	96
5 043.6	1.177	1,g	0	1	0	5	1	0	0	1	8	97
5 068.5	1.188	0,g^+	0	0	0	8	0	0	0	0	8	93
5 071.0	1.188	2,g	0	0	0	8	2	0	0	0	8	93
5 099.0	1.188	0,u^+	0	0	0	7	1	1	−1	0	8	94
5 099.7	1.188	2,u	0	0	0	7	3	1	−1	0	8	70
5 103.2	1.176	1,u	0	0	1	3	1	0	0	1	8	49
		1,u	0	1	0	4	2	1	−1	1	8	32
5 115.0	1.167	0,g^+	0	2	0	2	0	0	0	2	8	100
5 117.8	1.167	2,g	0	2	0	2	2	0	0	2	8	100
5 125.5	1.176	1,u	0	0	1	3	1	0	0	1	8	50
		1,u	0	1	0	4	2	1	−1	1	8	38
5 137.0	1.189	0,u^-	0	0	0	7	−1	1	1	0	8	89
5 141.0	1.189	2,g	0	0	0	6	4	2	−2	0	8	66
5 142.0	1.189	2,u	0	0	0	7	1	1	1	0	8	67
5 142.7	1.178	1,u	0	1	0	4	2	1	−1	1	8	28
		1,u	0	1	0	4	0	1	1	1	8	68
5 143.0	1.189	0,g^+	0	0	0	6	2	2	−2	0	8	58
		0,g^+	0	0	0	6	0	2	0	0	8	35
5 172.9	1.189	0,g^-	0	0	0	6	−2	2	2	0	8	93
5 176.4	1.175	1,g	1	0	0	3	1	0	0	1	8	43
5 178.0	1.189	2,g	0	0	0	6	0	2	2	0	8	45
5 192.9	1.190	2,u	0	0	0	5	5	3	−3	0	8	74
5 194.2	1.177	1,g	1	0	0	3	1	0	0	1	8	39
		1,g	0	1	0	3	3	2	−2	1	8	39
5 198.7	1.190	0,u^+	0	0	0	5	3	3	−3	0	8	42
		0,u^+	0	0	0	5	1	3	−1	0	8	53

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
5 209.1	1.177	1,*g*	0	1	0	3	−1	2	2	1	8	35
5 214.7	1.177	1,*g*	0	0	1	2	2	1	−1	1	8	45
		1,*g*	0	1	0	3	3	2	−2	1	8	27
5 216.5	1.189	$0,g^+$	0	0	0	6	2	2	−2	0	8	35
		$0,g^+$	0	0	0	6	0	2	0	0	8	47
5 220.6	1.190	$0,u^-$	0	0	0	5	−3	3	3	0	8	84
5 222.7	1.189	2,*g*	0	0	0	6	2	2	0	0	8	38
		2,*g*	0	0	0	6	0	2	2	0	8	40
5 225.3	1.190	2,*u*	0	0	0	5	1	3	1	0	8	34
5 229.9	1.177	1,*g*	0	0	1	2	0	1	1	1	8	48
5 230.1	1.168	$0,u^+$	0	2	0	1	1	1	−1	2	8	90
5 244.9	1.168	$0,u^-$	0	2	0	1	−1	1	1	2	8	100
5 247.0	1.179	1,*g*	0	1	0	3	1	2	0	1	8	51
		1,*g*	0	1	0	3	−1	2	2	1	8	39
5 252.6	1.168	2,*u*	0	2	0	1	1	1	1	2	8	100
5 254.6	1.190	$0,u^+$	0	0	0	5	3	3	−3	0	8	54
		$0,u^+$	0	0	0	5	1	3	−1	0	8	35
5 260.4	1.165	$0,u^+$	0	1	1	0	0	0	0	2	8	90
5 261.6	1.190	2,*u*	0	0	0	5	3	3	−1	0	8	35
		2,*u*	0	0	0	5	−1	3	3	0	8	49
5 266.3	1.191	$0,g^+$	0	0	0	4	4	4	−4	0	8	38
		$0,g^+$	0	0	0	4	2	4	−2	0	8	39
5 270.2	1.175	1,*u*	1	0	0	2	2	1	−1	1	8	53
5 279.7	1.191	$0,g^-$	0	0	0	4	−4	4	4	0	8	80
5 282.6	1.191	2,*g*	0	0	0	4	4	4	−2	0	8	41
		2,*g*	0	0	0	4	2	4	0	0	8	32
5 290.0	1.176	1,*u*	1	0	0	2	2	1	−1	1	8	41
		1,*u*	1	0	0	2	0	1	1	1	8	30
5 300.9	1.190	$0,u^-$	0	0	0	5	−1	3	1	0	8	66
5 302.4	1.178	1,*u*	1	0	0	2	0	1	1	1	8	33
5 303.0	1.191	$0,g^+$	0	0	0	4	4	4	−4	0	8	59
5 308.3	1.190	2,*u*	0	0	0	5	1	3	1	0	8	42
5 311.5	1.191	2,*g*	0	0	0	4	4	4	−2	0	8	34
		2,*g*	0	0	0	4	−2	4	4	0	8	39
5 316.5	1.178	1,*u*	0	1	0	2	2	3	−1	1	8	28
		1,*u*	0	1	0	2	−2	3	3	1	8	31
5 323.0	1.177	1,*u*	0	0	1	1	1	2	0	1	8	43
5 335.0	1.164	$0,g^+$	1	1	0	0	0	0	0	2	8	98
5 336.0	1.178	1,*u*	0	0	1	1	1	2	0	1	8	25
		1,*u*	0	0	1	1	−1	2	2	1	8	34
5 338.8	1.191	$0,g^-$	0	0	0	4	−2	4	2	0	8	68
5 347.6	1.191	2,*g*	0	0	0	4	2	4	0	0	8	25
		2,*g*	0	0	0	4	−2	4	4	0	8	41
5 353.2	1.180	1,*u*	0	1	0	2	0	3	1	1	8	59
5 355.3	1.192	$0,u^+$	0	0	0	3	3	5	−3	0	8	38
		$0,u^+$	0	0	0	3	1	5	−1	0	8	58
5 371.7	1.192	2,*u*	0	0	0	3	1	5	1	0	8	31
		2,*u*	0	0	0	3	−1	5	3	0	8	27
5 377.2	1.169	$0,g^+$	0	2	0	0	0	2	0	2	8	99
5 383.3	1.176	1,*g*	1	0	0	1	1	2	0	1	8	46
		1,*g*	1	0	0	1	−1	2	2	1	8	40
5 383.9	1.192	$0,u^-$	0	0	0	3	−3	5	3	0	8	83
5 387.1	1.191	$0,g^+$	0	0	0	4	2	4	−2	0	8	35
		$0,g^+$	0	0	0	4	0	4	0	0	8	37
5 390.4	1.169	2,*g*	0	2	0	0	0	2	2	2	8	100
5 395.6	1.191	2,*g*	0	0	0	4	2	4	0	0	8	26
		2,*g*	0	0	0	4	0	4	2	0	8	38
5 397.8	1.192	2,*u*	0	0	0	3	3	5	−1	0	8	30
		2,*u*	0	0	0	3	−3	5	5	0	8	55
5 404.3	1.176	1,*g*	1	0	0	1	1	2	0	1	8	42
		1,*g*	1	0	0	1	−1	2	2	1	8	55
5 421.9	1.192	$0,u^+$	0	0	0	3	3	5	−3	0	8	57
		$0,u^+$	0	0	0	3	1	5	−1	0	8	32
5 422.3	1.180	1,*g*	0	1	0	1	1	4	0	1	8	32

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		1,g	0	1	0	1	−1	4	2	1	8	37
5 432.7	1.192	2,u	0	0	0	3	3	5	−1	0	8	30
		2,u	0	0	0	3	−1	5	3	0	8	27
		2,u	0	0	0	3	−3	5	5	0	8	26
5 439.9	1.178	1,g	0	0	1	0	0	3	1	1	8	70
5 455.4	1.193	0,g^+	0	0	0	2	2	6	−2	0	8	55
		0,g^+	0	0	0	2	0	6	0	0	8	41
5 458.6	1.181	1,g	0	1	0	1	1	4	0	1	8	48
		1,g	0	1	0	1	−1	4	2	1	8	49
5 470.6	1.193	2,g	0	0	0	2	2	6	0	0	8	27
		2,g	0	0	0	2	0	6	2	0	8	41
		2,g	0	0	0	2	−2	6	4	0	8	28
5 472.4	1.192	0,u^-	0	0	0	3	−1	5	1	0	8	64
5 482.1	1.192	2,u	0	0	0	3	1	5	1	0	8	37
		2,u	0	0	0	3	−1	5	3	0	8	29
5 499.9	1.193	0,g^-	0	0	0	2	−2	6	2	0	8	93
5 510.7	1.177	1,u	1	0	0	0	0	3	1	1	8	96
5 512.7	1.193	2,g	0	0	0	2	2	6	0	0	8	42
		2,g	0	0	0	2	−2	6	4	0	8	52
5 554.0	1.193	0,g^+	0	0	0	2	2	6	−2	0	8	37
		0,g^+	0	0	0	2	0	6	0	0	8	44
5 560.0	1.181	1,u	0	1	0	0	0	5	1	1	8	96
5 564.9	1.193	2,g	0	0	0	2	0	6	2	0	8	45
5 566.8	1.194	0,u^+	0	0	0	1	1	7	−1	0	8	96
5 581.1	1.194	2,u	0	0	0	1	1	7	1	0	8	46
		2,u	0	0	0	1	−1	7	3	0	8	50
5 628.6	1.193	0,u^-	0	0	0	1	−1	7	1	0	8	90
5 640.7	1.193	2,u	0	0	0	1	1	7	1	0	8	46
		2,u	0	0	0	1	−1	7	3	0	8	44
5 676.4	1.179	0,g^+	0	1	0	6	0	0	0	1	9	94
5 679.2	1.179	2,g	0	1	0	6	2	0	0	1	9	95
5 689.5	1.194	0,g^+	0	0	0	0	0	8	0	0	8	94
5 703.1	1.194	2,g	0	0	0	0	0	8	2	0	8	94
5 718.3	1.168	1,g	0	2	0	3	1	0	0	2	9	99
5 722.3	1.178	0,u^+	0	0	1	4	0	0	0	1	9	52
		0,u^+	0	1	0	5	1	1	−1	1	9	44
5 724.4	1.178	2,u	0	0	1	4	2	0	0	1	9	49
		2,u	0	1	0	5	3	1	−1	1	9	36
5 726.8	1.189	1,g	0	0	0	9	1	0	0	0	9	87
5 746.1	1.190	1,u	0	0	0	8	2	1	−1	0	9	55
		1,u	0	0	0	8	0	1	1	0	9	34
5 748.5	1.178	0,u^+	0	0	1	4	0	0	0	1	9	46
		0,u^+	0	1	0	5	1	1	−1	1	9	52
5 749.2	1.178	2,u	0	0	1	4	2	0	0	1	9	49
		2,u	0	1	0	5	3	1	−1	1	9	43
5 767.3	1.179	0,u^-	0	1	0	5	−1	1	1	1	9	94
5 772.9	1.179	2,u	0	1	0	5	1	1	1	1	9	77
5 780.1	1.191	1,g	0	0	0	7	3	2	−2	0	9	45
		1,g	0	0	0	7	1	2	0	0	9	28
5 785.7	1.177	0,g^+	1	0	0	4	0	0	0	1	9	26
		0,g^+	0	0	1	3	1	1	−1	1	9	47
5 787.9	1.178	2,g	0	0	1	3	3	1	−1	1	9	34
5 788.0	1.190	1,u	0	0	0	8	2	1	−1	0	9	32
		1,u	0	0	0	8	0	1	1	0	9	52
5 807.3	1.178	2,g	1	0	0	4	2	0	0	1	9	48
		2,g	0	1	0	4	4	2	−2	1	9	39
5 809.9	1.178	0,g^+	1	0	0	4	0	0	0	1	9	47
		0,g^+	0	1	0	4	2	2	−2	1	9	31
5 814.4	1.191	1,g	0	0	0	7	3	2	−2	0	9	35
		1,g	0	0	0	7	−1	2	2	0	9	48
5 818.0	1.169	1,u	0	2	0	2	2	1	−1	2	9	66
5 819.9	1.179	0,g^-	0	0	1	3	−1	1	1	1	9	46
		0,g^-	0	1	0	4	−2	2	2	1	9	51
5 824.9	1.191	1,u	0	0	0	6	4	3	−3	0	9	43

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		1,*u*	0	0	0	6	2	3	−1	0	9	27
5 825.3	1.178	2,*g*	0	0	1	3	3	1	−1	1	9	55
5 828.9	1.178	2,*g*								1	9	<25
5 830.9	1.177	$0,g^+$	0	0	1	3	1	1	−1	1	9	52
5 841.3	1.169	1,*u*	0	2	0	2	2	1	−1	2	9	29
		1,*u*	0	2	0	2	0	1	1	2	9	69
5 844.1	1.179	$0,g^-$	0	0	1	3	−1	1	1	1	9	52
		$0,g^-$	0	1	0	4	−2	2	2	1	9	46
5 850.6	1.178	2,*g*	0	0	1	3	1	1	1	1	9	51
5 851.8	1.166	1,*u*	0	1	1	1	1	0	0	2	9	85
5 853.1	1.192	1,*u*	0	0	0	6	4	3	−3	0	9	33
		1,*u*	0	0	0	6	−2	3	3	0	9	36
5 862.6	1.191	1,*g*	0	0	0	7	1	2	0	0	9	39
5 865.2	1.180	$0,g^+$	0	1	0	4	2	2	−2	1	9	37
		$0,g^+$	0	1	0	4	0	2	0	1	9	56
5 866.4	1.178	$0,u^+$	1	0	0	3	1	1	−1	1	9	42
5 872.6	1.180	2,*g*	0	1	0	4	2	2	0	1	9	37
		2,*g*	0	1	0	4	0	2	2	1	9	54
5 875.0	1.177	2,*u*	1	0	0	3	3	1	−1	1	9	58
5 878.3	1.158	$0,g^+$	0	3	0	0	0	0	0	3	9	100
5 880.7	1.192	1,*g*	0	0	0	5	5	4	−4	0	9	52
5 889.3	1.179	$0,u^-$	0	0	1	2	−2	2	2	1	9	44
		$0,u^-$	0	1	0	3	−3	3	3	1	9	28
5 891.8	1.192	1,*u*	0	0	0	6	2	3	−1	0	9	26
		1,*u*	0	0	0	6	−2	3	3	0	9	37
5 893.3	1.179	$0,u^+$	1	0	0	3	1	1	−1	1	9	39
		$0,u^+$	0	1	0	3	3	3	−3	1	9	31
		$0,u^+$	0	1	0	3	1	3	−1	1	9	26
5 899.2	1.178	2,*u*	1	0	0	3	3	1	−1	1	9	36
5 902.5	1.192	1,*g*	0	0	0	5	5	4	−4	0	9	29
5 908.2	1.178	$0,u^-$	1	0	0	3	−1	1	1	1	9	57
		$0,u^-$	0	1	0	3	−3	3	3	1	9	38
5 911.7	1.179	2,*u*	1	0	0	3	1	1	1	1	9	42
		2,*u*	0	1	0	3	3	3	−1	1	9	33
5 916.8	1.179	$0,u^+$	0	0	1	2	2	2	−2	1	9	54
5 920.4	1.165	1,*g*	1	1	0	1	1	0	0	2	9	94
5 921.9	1.180	$0,u^+$	0	0	1	2	0	2	0	1	9	37
		$0,u^+$	0	1	0	3	3	3	−3	1	9	37
5 927.0	1.179	$0,u^-$	0	0	1	2	−2	2	2	1	9	56
5 932.0	1.179	2,*u*	0	0	1	2	2	2	0	1	9	43
		2,*u*	0	1	0	3	−1	3	3	1	9	35
5 932.1	1.192	1,*g*	0	0	0	5	−3	4	4	0	9	42
5 933.5	1.179	2,*u*	0	1	0	3	3	3	−1	1	9	30
5 943.2	1.192	1,*u*	0	0	0	6	0	3	1	0	9	32
5 944.0	1.179	$0,u^+$	0	0	1	2	0	2	0	1	9	39
5 948.1	1.170	1,*g*	0	2	0	1	1	2	0	2	9	38
		1,*g*	0	2	0	1	−1	2	2	2	9	49
5 953.9	1.179	2,*u*	0	0	1	2	0	2	2	1	9	47
5 961.6	1.193	1,*u*								0	9	<25
5 964.4	1.178	$0,g^+$	1	0	0	2	2	2	−2	1	9	43
		$0,g^+$	1	0	0	2	0	2	0	1	9	29
5 966.3	1.181	$0,u^-$	0	1	0	3	−1	3	1	1	9	83
5 968.1	1.170	1,*g*	0	2	0	1	1	2	0	2	9	58
		1,*g*	0	2	0	1	−1	2	2	2	9	39
5 973.0	1.192	1,*g*	0	0	0	5	3	4	−2	0	9	27
5 975.3	1.181	2,*u*	0	1	0	3	1	3	1	1	9	50
		2,*u*	0	1	0	3	−1	3	3	1	9	33
5 981.7	1.167	1,*g*	0	1	1	0	0	1	1	2	9	86
5 982.0	1.178	2,*g*	1	0	0	2	2	2	0	1	9	44
		2,*g*	1	0	0	2	0	2	2	1	9	25
5 983.0	1.193	1,*u*	0	0	0	4	4	5	−3	0	9	28
		1,*u*	0	0	0	4	−4	5	5	0	9	46
5 983.1	1.177	$0,g^-$	1	0	0	2	−2	2	2	1	9	92
5 997.5	1.180	$0,g^+$	1	0	0	2	2	2	−2	1	9	33

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,g^+$	0	1	0	2	2	4	−2	1	9	27
6 008.5	1.178	$0,g^+$	1	0	0	2	0	2	0	1	9	52
6 009.1	1.178	$2,g$	1	0	0	2	2	2	0	1	9	43
6 012.1	1.193	$1,u$	0	0	0	4	4	5	−3	0	9	30
		$1,u$	0	0	0	4	−4	5	5	0	9	32
6 018.6	1.180	$2,g$	1	0	0	2	0	2	2	1	9	40
6 023.5	1.181	$0,g^-$	0	0	1	1	−1	3	1	1	9	31
		$0,g^-$	0	1	0	2	−2	4	2	1	9	62
6 024.6	1.179	$0,g^+$	0	0	1	1	1	3	−1	1	9	62
6 026.5	1.192	$1,g$	0	0	0	5	1	4	0	0	9	27
6 036.5	1.180	$2,g$	0	0	1	1	−1	3	3	1	9	25
		$2,g$	0	1	0	2	2	4	0	1	9	30
6 040.1	1.180	$2,g$	0	0	1	1	1	3	1	1	9	53
6 044.1	1.180	$0,g^-$	0	0	1	1	−1	3	1	1	9	63
		$0,g^-$	0	1	0	2	−2	4	2	1	9	35
6 050.8	1.194	$1,g$	0	0	0	3	1	6	0	0	9	29
		$1,g$	0	0	0	3	−1	6	2	0	9	29
6 052.9	1.166	$1,u$	1	1	0	0	0	1	1	2	9	97
6 054.6	1.193	$1,u$	0	0	0	4	−2	5	3	0	9	32
6 057.0	1.180	$2,g$	0	0	1	1	−1	3	3	1	9	36
6 067.7	1.182	$0,g^+$	0	1	0	2	2	4	−2	1	9	39
		$0,g^+$	0	1	0	2	0	4	0	1	9	54
6 078.4	1.182	$2,g$	0	1	0	2	0	4	2	1	9	55
6 080.5	1.178	$0,u^+$	1	0	0	1	1	3	−1	1	9	83
6 087.9	1.194	$1,g$	0	0	0	3	3	6	−2	0	9	36
		$1,g$	0	0	0	3	−3	6	4	0	9	44
6 095.7	1.171	$1,u$	0	2	0	0	0	3	1	2	9	97
6 096.0	1.178	$2,u$	1	0	0	1	1	3	1	1	9	45
		$2,u$	1	0	0	1	−1	3	3	1	9	38
6 110.1	1.193	$1,u$	0	0	0	4	0	5	1	0	9	29
6 111.0	1.178	$0,u^-$	1	0	0	1	−1	3	1	1	9	97
6 122.1	1.182	$0,u^+$	0	1	0	1	1	5	−1	1	9	69
6 122.3	1.178	$2,u$	1	0	0	1	1	3	1	1	9	35
		$2,u$	1	0	0	1	−1	3	3	1	9	59
6 133.3	1.194	$1,g$	0	0	0	3	3	6	−2	0	9	28
		$1,g$	0	0	0	3	−3	6	4	0	9	27
6 136.7	1.182	$2,u$	0	1	0	1	1	5	1	1	9	30
		$2,u$	0	1	0	1	−1	5	3	1	9	40
6 140.9	1.180	$0,u^+$	0	0	1	0	0	4	0	1	9	73
6 151.0	1.195	$1,u$	0	0	0	2	2	7	−1	0	9	26
		$1,u$	0	0	0	2	0	7	1	0	9	40
		$1,u$	0	0	0	2	−2	7	3	0	9	28
6 155.0	1.180	$2,u$	0	0	1	0	0	4	2	1	9	71
6 166.6	1.183	$0,u^-$	0	1	0	1	−1	5	1	1	9	95
6 178.9	1.183	$2,u$	0	1	0	1	1	5	1	1	9	47
		$2,u$	0	1	0	1	−1	5	3	1	9	48
6 191.4	1.194	$1,g$	0	0	0	3	1	6	0	0	9	28
		$1,g$	0	0	0	3	−1	6	2	0	9	25
6 205.2	1.195	$1,u$	0	0	0	2	2	7	−1	0	9	43
		$1,u$	0	0	0	2	−2	7	3	0	9	47
6 209.5	1.179	$0,g^+$	1	0	0	0	0	4	0	1	9	95
6 223.6	1.179	$2,g$	1	0	0	0	0	4	2	1	9	95
6 259.9	1.184	$0,g^+$	0	1	0	0	0	6	0	1	9	94
6 262.5	1.196	$1,g$	0	0	0	1	1	8	0	0	9	45
		$1,g$	0	0	0	1	−1	8	2	0	9	48
6 267.5	1.195	$1,u$	0	0	0	2	0	7	1	0	9	38
6 273.4	1.184	$2,g$	0	1	0	0	0	6	2	1	9	95
6 316.0	1.180	$1,g$	0	1	0	7	1	0	0	1	10	90
6 327.8	1.170	$0,g^+$	0	2	0	4	0	0	0	2	10	98
6 330.7	1.170	$2,g$	0	2	0	4	2	0	0	2	10	98
6 335.4	1.196	$1,g$	0	0	0	1	1	8	0	0	9	43
		$1,g$	0	0	0	1	−1	8	2	0	9	42
6 348.0	1.179	$1,u$	0	0	1	5	1	0	0	1	10	52
		$1,u$	0	1	0	6	2	1	−1	1	10	25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
6 377.9	1.179	1,*u*	0	0	1	5	1	0	0	1	10	45
		1,*u*	0	1	0	6	2	1	−1	1	10	37
6 385.4	1.197	1,*u*	0	0	0	0	0	9	1	0	9	90
6 386.7	1.191	0,g^+	0	0	0	10	0	0	0	0	10	74
6 389.4	1.191	2,*g*	0	0	0	10	2	0	0	0	10	75
6 396.1	1.191	0,u^+	0	0	0	9	1	1	−1	0	10	80
6 397.6	1.191	2,*u*	0	0	0	9	3	1	−1	0	10	58
6 400.2	1.181	1,*u*	0	1	0	6	2	1	−1	1	10	31
		1,*u*	0	1	0	6	0	1	1	1	10	60
6 401.4	1.179	1,*g*	0	0	1	4	2	1	−1	1	10	32
6 413.6	1.170	0,u^+	0	2	0	3	1	1	−1	2	10	81
6 414.5	1.170	2,*u*	0	2	0	3	3	1	−1	2	10	72
6 422.5	1.192	2,*g*	0	0	0	8	4	2	−2	0	10	54
6 423.4	1.192	0,g^+	0	0	0	8	2	2	−2	0	10	52
6 429.7	1.179	1,*g*	1	0	0	5	1	0	0	1	10	41
		1,*g*	0	1	0	5	3	2	−2	1	10	33
6 439.9	1.192	0,u^-	0	0	0	9	−1	1	1	0	10	76
6 440.8	1.180	1,*g*	0	1	0	5	−1	2	2	1	10	31
6 442.1	1.171	0,u^-	0	2	0	3	−1	1	1	2	10	99
6 444.7	1.192	2,*u*	0	0	0	9	1	1	1	0	10	54
6 446.8	1.170	2,*u*	0	2	0	3	3	1	−1	2	10	27
		2,*u*	0	2	0	3	1	1	1	2	10	51
6 449.2	1.168	0,u^+	0	1	1	2	0	0	0	2	10	82
6 451.8	1.178	1,*g*	1	0	0	5	1	0	0	1	10	36
		1,*g*	0	0	1	4	2	1	−1	1	10	31
6 452.1	1.159	1,*g*	0	3	0	1	1	0	0	3	10	100
6 452.6	1.168	2,*u*	0	1	1	2	2	0	0	2	10	64
		2,*u*	0	2	0	3	1	1	1	2	10	34
6 455.5	1.193	2,*u*	0	0	0	7	5	3	−3	0	10	58
6 456.8	1.192	0,g^-	0	0	0	8	−2	2	2	0	10	81
6 459.5	1.193	0,u^+	0	0	0	7	3	3	−3	0	10	39
		0,u^+	0	0	0	7	1	3	−1	0	10	39
6 462.2	1.192	2,*g*	0	0	0	8	0	2	2	0	10	44
6 468.2	1.180	1,*g*	0	0	1	4	0	1	1	1	10	40
6 471.1	1.180	1,*u*								1	10	<25
6 487.2	1.193	0,u^-	0	0	0	7	−3	3	3	0	10	76
6 492.6	1.193	2,*u*	0	0	0	7	−1	3	3	0	10	26
6 492.7	1.182	1,*g*	0	1	0	5	1	2	0	1	10	47
		1,*g*	0	1	0	5	−1	2	2	1	10	32
6 495.9	1.180	1,*u*	0	1	0	4	4	3	−3	1	10	37
6 499.1	1.194	2,*g*	0	0	0	6	6	4	−4	0	10	70
6 502.9	1.166	0,g^+	0	0	2	0	0	0	0	2	10	47
		0,g^+	1	1	0	2	0	0	0	2	10	26
6 503.5	1.180	1,*u*	1	0	0	4	2	1	−1	1	10	35
6 506.5	1.194	0,g^+	0	0	0	6	4	4	−4	0	10	30
		0,g^+	0	0	0	6	2	4	−2	0	10	27
6 509.6	1.192	0,g^+	0	0	0	8	0	2	0	0	10	36
6 514.1	1.166	0,g^+	0	0	2	0	0	0	0	2	10	44
		0,g^+	1	1	0	2	0	0	0	2	10	35
6 514.7	1.167	2,*g*	1	1	0	2	2	0	0	2	10	89
6 515.1	1.192	2,*g*	0	0	0	8	2	2	0	0	10	29
		2,*g*	0	0	0	8	0	2	2	0	10	29
6 523.5	1.180	1,*u*	1	0	0	4	0	1	1	1	10	37
		1,*u*	0	1	0	4	4	3	−3	1	10	29
6 523.5	1.170	0,g^+	1	1	0	2	0	0	0	2	10	33
		0,g^+	0	2	0	2	2	2	−2	2	10	44
6 524.8	1.179	1,*u*	1	0	0	4	2	1	−1	1	10	31
		1,*u*	0	0	1	3	3	2	−2	1	10	31
6 527.8	1.194	0,g^-	0	0	0	6	−4	4	4	0	10	71
6 529.5	1.193	0,u^+	0	0	0	7	3	3	−3	0	10	48
6 532.5	1.194	2,*g*								0	10	<25
6 532.8	1.171	0,g^-	0	2	0	2	−2	2	2	2	10	85
6 535.8	1.193	2,*u*	0	0	0	7	−1	3	3	0	10	41
6 538.1	1.181	1,*u*	0	0	1	3	1	2	0	1	10	30

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		1,*u*	0	1	0	4	−2	3	3	1	10	33
6 541.1	1.171	2,*g*	0	2	0	2	2	2	0	2	10	54
		2,*g*	0	2	0	2	0	2	2	2	10	30
6 544.4	1.179	1,*u*	1	0	0	4	0	1	1	1	10	27
		1,*u*	0	0	1	3	−1	2	2	1	10	26
6 555.9	1.164	$0,u^+$	1	0	1	0	0	0	0	2	10	99
6 559.8	1.180	1,*g*								1	10	<25
6 561.2	1.171	$0,g^+$	0	2	0	2	0	2	0	2	10	67
6 561.4	1.194	$0,g^+$	0	0	0	6	4	4	−4	0	10	58
6 562.0	1.169	$0,g^+$	0	1	1	1	1	1	−1	2	10	63
		$0,g^+$	0	2	0	2	2	2	−2	2	10	29
6 563.3	1.181	1,*u*	0	0	1	3	1	2	0	1	10	27
6 565.7	1.194	$0,u^+$	0	0	0	5	5	5	−5	0	10	30
		$0,u^+$	0	0	0	5	3	5	−3	0	10	31
		$0,u^+$	0	0	0	5	1	5	−1	0	10	28
6 568.4	1.194	2,*g*	0	0	0	6	4	4	−2	0	10	26
		2,*g*	0	0	0	6	−2	4	4	0	10	38
6 569.0	1.171	2,*g*	0	2	0	2	2	2	0	2	10	42
		2,*g*	0	2	0	2	0	2	2	2	10	47
6 569.0	1.169	$0,g^-$	0	1	1	1	−1	1	1	2	10	85
6 578.5	1.169	2,*g*	0	1	1	1	1	1	1	2	10	76
6 579.8	1.195	$0,u^-$	0	0	0	5	−5	5	5	0	10	72
6 581.1	1.179	1,*g*	1	0	0	3	3	2	−2	1	10	50
6 581.4	1.194	2,*u*	0	0	0	5	5	5	−3	0	10	33
		2,*u*	0	0	0	5	3	5	−1	0	10	25
6 585.8	1.193	$0,u^-$	0	0	0	7	−1	3	1	0	10	42
6 589.5	1.183	1,*u*	0	1	0	4	0	3	1	1	10	47
6 592.3	1.193	2,*u*	0	0	0	7	1	3	1	0	10	27
6 596.3	1.181	1,*g*								1	10	<25
6 602.6	1.195	$0,u^+$	0	0	0	5	5	5	−5	0	10	63
6 603.7	1.181	1,*g*	0	1	0	3	−3	4	4	1	10	30
6 604.0	1.160	1,*u*	0	3	0	0	0	1	1	3	10	100
6 606.9	1.194	$0,g^-$	0	0	0	6	−2	4	2	0	10	45
6 610.9	1.195	2,*u*	0	0	0	5	5	5	−3	0	10	32
		2,*u*	0	0	0	5	−3	5	5	0	10	28
6 614.3	1.194	2,*g*	0	0	0	6	−2	4	4	0	10	30
6 620.7	1.180	1,*g*	1	0	0	3	−1	2	2	1	10	34
6 622.7	1.168	$0,u^+$	1	1	0	1	1	1	−1	2	10	87
6 623.1	1.180	1,*g*	1	0	0	3	1	2	0	1	10	30
6 636.8	1.167	$0,u^-$	1	1	0	1	−1	1	1	2	10	98
6 636.9	1.182	1,*g*								1	10	<25
6 638.3	1.195	$0,u^-$	0	0	0	5	−5	5	5	0	10	26
		$0,u^-$	0	0	0	5	−3	5	3	0	10	44
6 638.6	1.180	1,*g*	0	0	1	2	−2	3	3	1	10	29
6 641.6	1.168	2,*u*	1	1	0	1	1	1	1	2	10	88
6 644.9	1.195	$0,g^+$	0	0	0	4	4	6	−4	0	10	26
		$0,g^+$	0	0	0	4	2	6	−2	0	10	40
6 647.1	1.195	2,*u*	0	0	0	5	−3	5	5	0	10	41
6 654.8	1.172	$0,u^+$	0	2	0	1	1	3	−1	2	10	82
6 660.1	1.181	1,*g*	0	0	1	2	0	3	1	1	10	36
6 661.3	1.195	2,*g*								0	10	<25
6 663.8	1.180	1,*u*	1	0	0	2	0	3	1	1	10	28
6 665.8	1.194	$0,g^+$								0	10	<25
6 669.4	1.172	2,*u*	0	2	0	1	1	3	1	2	10	33
		2,*u*	0	2	0	1	−1	3	3	2	10	50
6 673.2	1.194	2,*g*								0	10	<25
6 675.7	1.195	$0,g^-$	0	0	0	4	−4	6	4	0	10	69
6 682.6	1.172	$0,u^-$	0	2	0	1	−1	3	1	2	10	98
6 685.9	1.195	$0,u^+$	0	0	0	5	3	5	−3	0	10	43
6 687.6	1.183	1,*g*	0	1	0	3	1	4	0	1	10	40
		1,*g*	0	1	0	3	−1	4	2	1	10	35
6 690.3	1.179	1,*u*	1	0	0	2	2	3	−1	1	10	35
		1,*u*	1	0	0	2	−2	3	3	1	10	55
6 690.3	1.195	2,*g*	0	0	0	4	−4	6	6	0	10	49

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
6 690.5	1.169	$0,u^+$	0	1	1	0	0	2	0	2	10	88
6 693.0	1.172	$2,u$	0	2	0	1	1	3	1	2	10	62
		$2,u$	0	2	0	1	−1	3	3	2	10	30
6 694.5	1.195	$2,u$								0	10	<25
6 701.7	1.182	$1,u$	0	1	0	2	0	5	1	1	10	25
6 705.7	1.170	$2,u$	0	1	1	0	0	2	2	2	10	80
6 709.2	1.163	$0,g^+$	2	0	0	0	0	0	0	2	10	92
6 713.6	1.195	$0,g^+$	0	0	0	4	4	6	−4	0	10	62
6 719.4	1.180	$1,u$	1	0	0	2	0	3	1	1	10	30
6 724.7	1.195	$2,g$	0	0	0	4	4	6	−2	0	10	28
		$2,g$	0	0	0	4	−4	6	6	0	10	33
6 730.4	1.181	$1,u$	1	0	0	2	0	3	1	1	10	31
		$1,u$	0	0	1	1	1	4	0	1	10	31
6 733.7	1.183	$1,u$	0	1	0	2	2	5	−1	1	10	26
		$1,u$	0	1	0	2	−2	5	3	1	10	35
6 734.7	1.196	$0,u^+$	0	0	0	3	3	7	−3	0	10	34
		$0,u^+$	0	0	0	3	1	7	−1	0	10	56
6 746.9	1.195	$0,u^-$	0	0	0	3	−1	7	1	0	10	26
		$0,u^-$	0	0	0	5	−1	5	1	0	10	32
6 750.1	1.196	$2,u$	0	0	0	3	1	7	1	0	10	34
6 755.0	1.182	$1,u$	0	0	1	1	1	4	0	1	10	30
		$1,u$	0	0	1	1	−1	4	2	1	10	34
6 755.3	1.195	$2,u$								0	10	<25
6 759.2	1.168	$0,g^+$	1	1	0	0	0	2	0	2	10	94
6 763.7	1.195	$0,g^-$	0	0	0	4	−2	6	2	0	10	43
6 773.2	1.168	$2,g$	1	1	0	0	0	2	2	2	10	96
6 773.4	1.195	$2,g$	0	0	0	4	−2	6	4	0	10	29
6 781.1	1.181	$1,g$	1	0	0	1	1	4	0	1	10	41
		$1,g$	1	0	0	1	−1	4	2	1	10	39
6 782.6	1.196	$0,u^-$	0	0	0	3	−3	7	3	0	10	77
6 784.5	1.184	$1,u$	0	1	0	2	0	5	1	1	10	50
6 795.7	1.196	$2,u$	0	0	0	3	3	7	−1	0	10	31
		$2,u$	0	0	0	3	−3	7	5	0	10	46
6 803.4	1.173	$0,g^+$	0	2	0	0	0	4	0	2	10	95
6 816.6	1.173	$2,g$	0	2	0	0	0	4	2	2	10	96
6 819.6	1.180	$1,g$	1	0	0	1	1	4	0	1	10	36
		$1,g$	1	0	0	1	−1	4	2	1	10	56
6 825.1	1.184	$1,g$	0	1	0	1	1	6	0	1	10	31
		$1,g$	0	1	0	1	−1	6	2	1	10	37
6 826.6	1.195	$0,g^+$								0	10	<25
6 835.8	1.195	$2,g$								0	10	<25
6 835.8	1.197	$0,g^+$	0	0	0	2	2	8	−2	0	10	58
		$0,g^+$	0	0	0	2	0	8	0	0	10	29
6 836.7	1.196	$0,u^+$	0	0	0	3	3	7	−3	0	10	51
6 844.5	1.183	$1,g$	0	0	1	0	0	5	1	1	10	74
6 847.9	1.196	$2,u$	0	0	0	3	3	7	−1	0	10	26
		$2,u$	0	0	0	3	−3	7	5	0	10	25
6 850.3	1.197	$2,g$	0	0	0	2	2	8	0	0	10	26
		$2,g$	0	0	0	2	0	8	2	0	10	35
		$2,g$	0	0	0	2	−2	8	4	0	10	29
6 877.3	1.185	$1,g$	0	1	0	1	1	6	0	1	10	47
		$1,g$	0	1	0	1	−1	6	2	1	10	46
6 901.8	1.197	$0,g^-$	0	0	0	2	−2	8	2	0	10	83
6 903.2	1.196	$0,u^-$	0	0	0	3	−1	7	1	0	10	39
6 910.9	1.181	$1,u$	1	0	0	0	0	5	1	1	10	93
6 913.2	1.196	$2,u$								0	10	<25
6 914.2	1.197	$2,g$	0	0	0	2	2	8	0	0	10	38
		$2,g$	0	0	0	2	−2	8	4	0	10	46
6 946.0	1.171	$1,g$	0	2	0	5	1	0	0	2	11	96
6 947.7	1.198	$0,u^+$	0	0	0	1	1	9	−1	0	10	89
6 958.7	1.181	$0,g^+$	0	1	0	8	0	0	0	1	11	82
6 961.6	1.198	$2,u$	0	0	0	1	1	9	1	0	10	41
		$2,u$	0	0	0	1	−1	9	3	0	10	48
6 961.8	1.181	$2,g$	0	1	0	8	2	0	0	1	11	83

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
6 962.3	1.186	1,u	0	1	0	0	0	7	1	1	10	92
6 973.1	1.197	0,g^+	0	0	0	2	2	8	−2	0	10	29
		0,g^+	0	0	0	2	0	8	0	0	10	29
6 977.6	1.180	0,u^+	0	0	1	6	0	0	0	1	11	51
		0,u^+	0	1	0	7	1	1	−1	1	11	37
6 980.3	1.180	2,u	0	0	1	6	2	0	0	1	11	51
		2,u	0	1	0	7	3	1	−1	1	11	27
6 984.1	1.197	2,g	0	0	0	2	0	8	2	0	10	31
7 012.6	1.181	0,u^+	0	0	1	6	0	0	0	1	11	44
		0,u^+	0	1	0	7	1	1	−1	1	11	52
7 013.7	1.181	2,u	0	0	1	6	2	0	0	1	11	44
		2,u	0	1	0	7	3	1	−1	1	11	42
7 016.7	1.171	1,u	0	2	0	4	2	1	−1	2	11	51
		1,u	0	2	0	4	0	1	1	2	11	26
7 021.8	1.181	0,g^+	0	0	1	5	1	1	−1	1	11	52
7 023.6	1.181	2,g	0	0	1	5	3	1	−1	1	11	37
7 033.5	1.161	0,g^+	0	3	0	2	0	0	0	3	11	100
7 034.4	1.198	0,u^-	0	0	0	1	−1	9	1	0	10	76
7 035.0	1.182	0,u^-	0	1	0	7	−1	1	1	1	11	84
7 036.4	1.161	2,g	0	3	0	2	2	0	0	3	11	100
7 040.5	1.182	2,u	0	1	0	7	1	1	1	1	11	65
7 046.2	1.198	2,u	0	0	0	1	1	9	1	0	10	40
		2,u	0	0	0	1	−1	9	3	0	10	38
7 046.7	1.193	1,g	0	0	0	9	1	2	0	0	11	37
		1,g	0	0	0	11	1	0	0	0	11	42
7 048.4	1.193	1,u	0	0	0	10	2	1	−1	0	11	38
		1,u	0	0	0	10	0	1	1	0	11	25
7 052.2	1.171	1,u	0	2	0	4	2	1	−1	2	11	47
		1,u	0	2	0	4	0	1	1	2	11	30
7 055.5	1.181	2,g	1	0	0	6	2	0	0	1	11	29
		2,g	0	1	0	6	4	2	−2	1	11	40
7 055.8	1.170	1,u	0	1	1	3	1	0	0	2	11	57
		1,u	0	2	0	4	0	1	1	2	11	41
7 056.5	1.181	0,g^+	1	0	0	6	0	0	0	1	11	33
		0,g^+	0	1	0	6	2	2	−2	1	11	29
7 062.7	1.181	0,g^-	0	0	1	5	−1	1	1	1	11	47
		0,g^-	0	1	0	6	−2	2	2	1	11	43
7 068.8	1.181	2,g	0	0	1	5	3	1	−1	1	11	31
		2,g	0	1	0	6	0	2	2	1	11	25
7 071.6	1.199	0,g^+	0	0	0	0	0	10	0	0	10	84
7 073.6	1.193	1,g	0	0	0	9	3	2	−2	0	11	30
		1,g	0	0	0	11	1	0	0	0	11	38
7 080.1	1.180	2,g	1	0	0	6	2	0	0	1	11	48
7 080.4	1.181	0,u^+	0	0	1	4	2	2	−2	1	11	29
7 081.9	1.181	2,u	0	0	1	4	4	2	−2	1	11	32
7 082.2	1.179	0,g^+	1	0	0	6	0	0	0	1	11	48
		0,g^+	0	0	1	5	1	1	−1	1	11	33
7 084.8	1.199	2,g	0	0	0	0	0	10	2	0	10	85
7 092.6	1.168	1,g	0	0	2	1	1	0	0	2	11	55
7 094.1	1.182	0,g^-	0	0	1	5	−1	1	1	1	11	47
		0,g^-	0	1	0	6	−2	2	2	1	11	48
7 095.9	1.193	1,u	0	0	0	10	0	1	1	0	11	42
7 097.8	1.194	1,u	0	0	0	8	4	3	−3	0	11	28
		1,u	0	0	0	10	2	1	−1	0	11	26
7 100.6	1.181	2,g	0	0	1	5	1	1	1	1	11	43
7 104.6	1.194	1,g	0	0	0	9	3	2	−2	0	11	28
		1,g	0	0	0	9	−1	2	2	0	11	39
7 108.0	1.170	1,g	0	0	2	1	1	0	0	2	11	31
		1,g	0	2	0	3	3	2	−2	2	11	28
7 109.3	1.182	2,u	0	1	0	5	5	3	−3	1	11	40
7 111.5	1.182	0,u^-	0	0	1	4	−2	2	2	1	11	50
		0,u^-	0	1	0	5	−3	3	3	1	11	30
7 117.1	1.182	0,u^+	1	0	0	5	1	1	−1	1	11	38
		0,u^+	0	1	0	5	1	3	−1	1	11	32

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7 119.2	1.169	1,g	1	1	0	3	1	0	0	2	11	63
		1,g	0	2	0	3	3	2	−2	2	11	26
7 120.8	1.182	2,u								1	11	<25
7 121.7	1.183	0,g^+	0	1	0	6	2	2	−2	1	11	34
		0,g^+	0	1	0	6	0	2	0	1	11	46
7 128.4	1.183	2,g	0	1	0	6	2	2	0	1	11	36
		2,g	0	1	0	6	0	2	2	1	11	41
7 129.0	1.194	1,u	0	0	0	8	4	3	−3	0	11	28
		1,u	0	0	0	8	−2	3	3	0	11	33
7 131.2	1.172	1,g	0	2	0	3	−1	2	2	2	11	46
7 133.9	1.195	1,g	0	0	0	7	5	4	−4	0	11	38
7 137.8	1.181	2,u	1	0	0	5	3	1	−1	1	11	29
		2,u	0	0	1	4	4	2	−2	1	11	33
7 142.5	1.165	1,u	1	0	1	1	1	0	0	2	11	94
7 142.7	1.182	0,u^-	1	0	0	5	−1	1	1	1	11	37
		0,u^-	0	1	0	5	−3	3	3	1	11	41
7 145.8	1.181	0,u^+	1	0	0	5	1	1	−1	1	11	36
		0,u^+	0	0	1	4	2	2	−2	1	11	33
7 146.2	1.181	2,u	1	0	0	5	1	1	1	1	11	26
7 153.8	1.182	0,g^+	0	0	1	3	1	3	−1	1	11	26
7 154.3	1.182	0,u^+	0	0	1	4	0	2	0	1	11	28
		0,u^+	0	1	0	5	3	3	−3	1	11	30
7 155.7	1.170	1,g	0	1	1	2	2	1	−1	2	11	68
7 160.2	1.162	0,u^+	0	3	0	1	1	1	−1	3	11	95
7 160.6	1.195	1,g	0	0	0	7	5	4	−4	0	11	27
7 162.5	1.182	2,u	0	0	1	4	2	2	0	1	11	38
		2,u	0	1	0	5	−1	3	3	1	11	34
7 162.7	1.194	1,g								0	11	<25
7 164.6	1.180	0,u^-	1	0	0	5	−1	1	1	1	11	45
		0,u^-	0	0	1	4	−2	2	2	1	11	37
7 165.2	1.181	2,g	1	0	0	4	4	2	−2	1	11	30
7 165.4	1.172	1,g	0	2	0	3	1	2	0	2	11	57
7 169.8	1.181	2,u	1	0	0	5	1	1	1	1	11	38
7 170.3	1.170	1,g	0	1	1	2	0	1	1	2	11	58
		1,g	0	2	0	3	−1	2	2	2	11	28
7 173.4	1.195	1,u	0	0	0	8	−2	3	3	0	11	29
7 174.3	1.162	0,u^-	0	3	0	1	−1	1	1	3	11	100
7 176.4	1.182	0,g^-	0	0	1	3	−3	3	3	1	11	42
7 181.6	1.196	1,u	0	0	0	6	6	5	−5	0	11	49
7 182.1	1.162	2,u	0	3	0	1	1	1	1	3	11	100
7 183.4	1.182	0,u^+	0	0	1	4	0	2	0	1	11	31
		0,u^+	0	1	0	5	3	3	−3	1	11	25
7 189.4	1.181	2,g	1	0	0	4	4	2	−2	1	11	52
7 190.0	1.183	0,g^+	0	1	0	4	4	4	−4	1	11	29
7 191.7	1.182	2,u	0	0	1	4	0	2	2	1	11	35
7 198.7	1.195	1,g	0	0	0	7	−3	4	4	0	11	33
7 203.1	1.196	1,u	0	0	0	6	6	5	−5	0	11	28
7 205.4	1.183	2,g	0	1	0	4	4	4	−2	1	11	34
7 206.0	1.183	0,g^+	0	0	1	3	3	3	−3	1	11	37
7 206.3	1.182	0,g^-	1	0	0	4	−2	2	2	1	11	48
		0,g^-	0	1	0	4	−4	4	4	1	11	39
7 206.9	1.169	1,u	1	1	0	2	2	1	−1	2	11	39
7 213.1	1.159	0,u^+	0	2	1	0	0	0	0	3	11	95
7 213.6	1.184	0,u^-	0	1	0	5	−1	3	1	1	11	66
7 219.3	1.168	1,u	0	0	2	0	0	1	1	2	11	57
		1,u	1	1	0	2	2	1	−1	2	11	29
7 219.6	1.182	0,g^+	0	0	1	3	1	3	−1	1	11	31
7 219.7	1.182	2,g								1	11	<25
7 221.3	1.184	2,u	0	1	0	5	1	3	1	1	11	42
7 229.2	1.170	1,u	0	0	2	0	0	1	1	2	11	26
7 229.6	1.182	0,g^-	1	0	0	4	−2	2	2	1	11	26
		0,g^-	0	0	1	3	−3	3	3	1	11	50
7 232.4	1.196	1,u	0	0	0	6	−4	5	5	0	11	33
7 234.6	1.182	2,g	0	0	1	3	3	3	−1	1	11	30

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7 234.7	1.182	$0,g^+$	0	1	0	4	4	4	−4	1	11	26
7 235.1	1.195	$1,u$								0	11	<25
7 235.7	1.171	$1,u$	1	1	0	2	0	1	1	2	11	56
7 240.9	1.182	$2,g$								1	11	<25
7 245.0	1.182	$0,u^+$	1	0	0	3	1	3	−1	1	11	31
7 247.8	1.195	$1,g$								0	11	<25
7 248.1	1.173	$1,u$	0	2	0	2	2	3	−1	2	11	35
		$1,u$	0	2	0	2	−2	3	3	2	11	45
7 248.6	1.183	$0,g^-$	0	0	1	3	−1	3	1	1	11	35
		$0,g^-$	0	1	0	4	−2	4	2	1	11	38
7 253.1	1.181	$0,g^+$	1	0	0	4	0	2	0	1	11	32
7 253.9	1.197	$1,g$								0	11	<25
7 258.5	1.183	$2,g$	0	0	1	3	1	3	1	1	11	32
		$2,g$	0	1	0	4	−2	4	4	1	11	33
7 261.7	1.182	$2,u$								1	11	<25
7 262.3	1.182	$2,g$	1	0	0	4	0	2	2	1	11	26
7 264.9	1.166	$1,g$	1	0	1	0	0	1	1	2	11	91
7 269.4	1.181	$0,u^-$	1	0	0	3	−3	3	3	1	11	69
7 272.9	1.196	$1,u$								0	11	<25
7 274.7	1.171	$1,u$	0	1	1	1	1	2	0	2	11	48
		$1,u$	0	1	1	1	−1	2	2	2	11	30
7 275.6	1.183	$0,g^-$	0	0	1	3	−1	3	1	1	11	47
		$0,g^-$	0	1	0	4	−2	4	2	1	11	30
7 277.0	1.197	$1,g$	0	0	0	5	−5	6	6	0	11	41
7 281.5	1.173	$1,u$	0	2	0	2	2	3	−1	2	11	30
		$1,u$	0	2	0	2	0	3	1	2	11	50
7 281.5	1.183	$0,u^+$	1	0	0	3	3	3	−3	1	11	40
		$0,u^+$	0	1	0	3	1	5	−1	1	11	28
7 282.5	1.158	$0,g^+$	1	2	0	0	0	0	0	3	11	97
7 285.6	1.183	$2,g$	0	0	1	3	1	3	1	1	11	27
7 287.1	1.171	$1,u$	0	1	1	1	1	2	0	2	11	30
		$1,u$	0	1	1	1	−1	2	2	2	11	42
7 291.1	1.182	$2,u$	1	0	0	3	3	3	−1	1	11	41
7 295.9	1.182	$0,u^+$	1	0	0	3	3	3	−3	1	11	36
		$0,u^+$	1	0	0	3	1	3	−1	1	11	29
7 297.6	1.164	$1,g$	2	0	0	1	1	0	0	2	11	86
7 303.2	1.184	$0,u^-$	0	0	1	2	−2	4	2	1	11	29
		$0,u^-$	0	1	0	3	−3	5	3	1	11	42
7 303.7	1.184	$2,u$								1	11	<25
7 305.4	1.197	$1,g$	0	0	0	5	5	6	−4	0	11	29
		$1,g$	0	0	0	5	−5	6	6	0	11	34
7 307.7	1.185	$0,g^+$	0	1	0	4	2	4	−2	1	11	36
		$0,g^+$	0	1	0	4	0	4	0	1	11	38
7 312.1	1.195	$1,g$								0	11	<25
7 315.6	1.182	$0,u^+$	0	0	1	2	2	4	−2	1	11	40
7 316.6	1.185	$2,g$	0	1	0	4	2	4	0	1	11	25
		$2,g$	0	1	0	4	0	4	2	1	11	39
7 318.7	1.183	$2,u$	0	1	0	3	−3	5	5	1	11	33
7 319.1	1.162	$0,g^+$	0	3	0	0	0	2	0	3	11	97
7 324.7	1.196	$1,u$								0	11	<25
7 328.1	1.183	$0,u^-$	1	0	0	3	−1	3	1	1	11	29
		$0,u^-$	0	1	0	3	−3	5	3	1	11	30
7 330.1	1.183	$2,u$	0	0	1	2	2	4	0	1	11	25
7 330.5	1.170	$1,g$	1	1	0	1	1	2	0	2	11	43
		$1,g$	1	1	0	1	−1	2	2	2	11	38
7 331.9	1.163	$2,g$	0	3	0	0	0	2	2	3	11	100
7 333.2	1.197	$1,u$								0	11	<25
7 337.7	1.183	$2,u$	1	0	0	3	1	3	1	1	11	28
7 342.6	1.184	$0,u^+$	0	1	0	3	3	5	−3	1	11	36
7 342.7	1.182	$0,u^-$	1	0	0	3	−1	3	1	1	11	51
		$0,u^-$	0	0	1	2	−2	4	2	1	11	33
7 347.6	1.197	$1,g$								0	11	<25
7 351.1	1.170	$1,g$	1	1	0	1	1	2	0	2	11	41
		$1,g$	1	1	0	1	−1	2	2	2	11	54

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7 351.1	1.182	$0,g^+$	1	0	0	2	2	4	−2	1	11	36
		$0,g^+$	1	0	0	2	0	4	0	1	11	27
7 353.3	1.183	$2,u$	0	0	1	2	2	4	0	1	11	31
7 355.8	1.184	$2,u$								1	11	<25
7 364.8	1.174	$1,g$	0	2	0	1	1	4	0	2	11	36
		$1,g$	0	2	0	1	−1	4	2	2	11	43
7 367.1	1.182	$2,g$	1	0	0	2	0	4	2	1	11	27
7 367.5	1.184	$0,u^+$	0	0	1	2	0	4	0	1	11	34
7 373.4	1.197	$1,u$	0	0	0	4	4	7	−3	0	11	28
		$1,u$	0	0	0	4	−4	7	5	0	11	37
7 379.1	1.183	$2,u$	0	0	1	2	0	4	2	1	11	34
7 387.4	1.182	$0,g^-$	1	0	0	2	−2	4	2	1	11	86
7 391.0	1.196	$1,u$								0	11	<25
7 393.3	1.185	$0,g^+$	0	1	0	2	2	6	−2	1	11	35
		$0,g^+$	0	1	0	2	0	6	0	1	11	27
7 398.1	1.174	$1,g$	0	2	0	1	1	4	0	2	11	55
		$1,g$	0	2	0	1	−1	4	2	2	11	27
7 400.6	1.182	$2,g$	1	0	0	2	2	4	0	1	11	26
		$2,g$	1	0	0	2	−2	4	4	1	11	60
7 401.4	1.197	$1,g$								0	11	<25
7 401.7	1.186	$0,u^-$	0	1	0	3	−1	5	1	1	11	67
7 402.7	1.172	$1,g$	0	1	1	0	0	3	1	2	11	73
7 408.5	1.185	$2,g$	0	1	0	2	0	6	2	1	11	26
7 411.7	1.186	$2,u$	0	1	0	3	1	5	1	1	11	37
		$2,u$	0	1	0	3	−1	5	3	1	11	30
7 417.4	1.184	$0,g^+$	0	0	1	1	1	5	−1	1	11	55
7 418.4	1.165	$1,u$	2	0	0	0	0	1	1	2	11	91
7 418.6	1.197	$1,u$	0	0	0	4	4	7	−3	0	11	28
		$1,u$	0	0	0	4	−4	7	5	0	11	30
7 423.3	1.198	$1,g$								0	11	<25
7 430.2	1.183	$2,g$	0	0	1	1	−1	5	3	1	11	35
7 431.1	1.182	$0,g^+$	1	0	0	2	0	4	0	1	11	56
7 433.3	1.185	$0,g^-$	0	0	1	1	−1	5	1	1	11	26
		$0,g^-$	0	1	0	2	−2	6	2	1	11	62
7 441.0	1.183	$2,g$	1	0	0	2	0	4	2	1	11	41
		$2,g$	0	0	1	1	1	5	1	1	11	33
7 447.7	1.185	$2,g$	0	1	0	2	−2	6	4	1	11	34
7 455.8	1.184	$0,g^-$	0	0	1	1	−1	5	1	1	11	64
		$0,g^-$	0	1	0	2	−2	6	2	1	11	30
7 468.0	1.171	$1,u$	1	1	0	0	0	3	1	2	11	90
7 469.0	1.184	$2,g$	0	0	1	1	1	5	1	1	11	29
		$2,g$	0	0	1	1	−1	5	3	1	11	34
7 469.3	1.197	$1,g$								0	11	<25
7 470.0	1.183	$0,u^+$	1	0	0	1	1	5	−1	1	11	77
7 475.6	1.198	$1,u$								0	11	<25
7 482.3	1.198	$1,g$	0	0	0	3	3	8	−2	0	11	35
		$1,g$	0	0	0	3	−3	8	4	0	11	40
7 484.8	1.183	$2,u$	1	0	0	1	1	5	1	1	11	40
		$2,u$	1	0	0	1	−1	5	3	1	11	37
7 493.0	1.186	$0,g^+$	0	1	0	2	2	6	−2	1	11	38
		$0,g^+$	0	1	0	2	0	6	0	1	11	46
7 504.1	1.186	$2,g$	0	1	0	2	0	6	2	1	11	46
7 513.3	1.175	$1,u$	0	2	0	0	0	5	1	2	11	92
7 516.4	1.186	$0,u^+$	0	1	0	1	1	7	−1	1	11	68
7 519.1	1.182	$0,u^-$	1	0	0	1	−1	5	1	1	11	93
7 523.9	1.199	$1,u$	0	0	0	2	0	9	1	0	11	42
7 528.7	1.184	$2,u$	1	0	0	1	−1	5	3	1	11	47
7 532.7	1.184	$2,u$	1	0	0	1	1	5	1	1	11	44
		$2,u$	0	1	0	1	−1	7	3	1	11	26
7 536.6	1.185	$0,u^+$	0	0	1	0	0	6	0	1	11	74
7 543.4	1.198	$1,g$								0	11	<25
7 546.6	1.198	$1,u$								0	11	<25
7 550.9	1.185	$2,u$	0	0	1	0	0	6	2	1	11	72
7 569.4	1.172	$0,g^+$	0	2	0	6	0	0	0	2	12	93

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7 572.5	1.172	2,*g*	0	2	0	6	2	0	0	2	12	94
7 578.6	1.187	0,u^-	0	1	0	1	−1	7	1	1	11	90
7 590.8	1.187	2,*u*	0	1	0	1	1	7	1	1	11	46
		2,*u*	0	1	0	1	−1	7	3	1	11	45
7 600.9	1.183	0,g^+	1	0	0	0	0	6	0	1	11	91
7 602.9	1.199	1,*u*	0	0	0	2	2	9	−1	0	11	36
		1,*u*	0	0	0	2	−2	9	3	0	11	40
7 605.7	1.182	1,*g*	0	1	0	9	1	0	0	1	12	67
7 612.8	1.182	1,*u*	0	0	1	7	1	0	0	1	12	48
7 614.8	1.183	2,*g*	1	0	0	0	0	6	2	1	11	91
7 617.8	1.198	1,*g*								0	11	<25
7 625.1	1.162	1,*g*	0	3	0	3	1	0	0	3	12	99
7 625.6	1.172	0,u^+	0	1	1	4	0	0	0	2	12	25
		0,u^+	0	2	0	5	1	1	−1	2	12	69
7 627.8	1.172	2,*u*	0	2	0	5	3	1	−1	2	12	55
7 637.2	1.200	1,*g*	0	0	0	1	1	10	0	0	11	37
		1,*g*	0	0	0	1	−1	10	2	0	11	45
7 649.4	1.182	1,*g*	0	0	1	6	2	1	−1	1	12	29
7 652.9	1.182	1,*u*	0	0	1	7	1	0	0	1	12	45
		1,*u*	0	1	0	8	2	1	−1	1	12	31
7 653.8	1.188	0,g^+	0	1	0	0	0	8	0	1	11	90
7 666.2	1.171	0,u^+	0	1	1	4	0	0	0	2	12	68
		0,u^+	0	2	0	5	1	1	−1	2	12	27
7 666.9	1.171	2,*u*	0	1	1	4	2	0	0	2	12	58
		2,*u*	0	2	0	5	3	1	−1	2	12	35
7 667.3	1.188	2,*g*	0	1	0	0	0	8	2	1	11	90
7 667.8	1.173	0,u^-	0	2	0	5	−1	1	1	2	12	94
7 674.7	1.173	2,*u*	0	2	0	5	1	1	1	2	12	75
7 676.3	1.183	1,*u*	0	1	0	8	2	1	−1	1	12	27
		1,*u*	0	1	0	8	0	1	1	1	12	47
7 681.3	1.199	1,*u*	0	0	0	0	0	11	1	0	11	26
7 686.3	1.169	0,g^+	0	0	2	2	0	0	0	2	12	55
7 687.1	1.183	1,*g*	0	1	0	7	3	2	−2	1	12	32
7 690.0	1.169	2,*g*	0	0	2	2	2	0	0	2	12	56
7 692.9	1.183	1,*g*	0	0	1	6	2	1	−1	1	12	28
		1,*g*	0	1	0	7	−1	2	2	1	12	28
7 696.6	1.183	1,*u*								1	12	<25
7 697.8	1.195	0,u^+	0	0	0	9	1	3	−1	0	12	45
		0,u^+	0	0	0	11	1	1	−1	0	12	38
7 697.8	1.195	0,g^+	0	0	0	10	0	2	0	0	12	37
7 700.7	1.195	2,*u*	0	0	0	9	3	3	−1	0	12	30
		2,*u*	0	0	0	11	3	1	−1	0	12	27
7 700.8	1.195	2,*g*	0	0	0	10	2	2	0	0	12	35
7 706.9	1.172	0,g^+	0	0	2	2	0	0	0	2	12	27
		0,g^+	0	2	0	4	2	2	−2	2	12	32
7 707.0	1.172	2,*g*	0	0	2	2	2	0	0	2	12	26
		2,*g*	0	2	0	4	4	2	−2	2	12	45
7 718.0	1.181	1,*g*	1	0	0	7	1	0	0	1	12	52
7 725.8	1.170	2,*g*	1	1	0	4	2	0	0	2	12	61
7 727.3	1.170	0,g^+	1	1	0	4	0	0	0	2	12	72
7 729.2	1.183	1,*g*	0	0	1	6	0	1	1	1	12	36
7 730.9	1.183	1,*u*	0	1	0	6	4	3	−3	1	12	26
7 731.2	1.173	0,g^-	0	2	0	4	−2	2	2	2	12	76
7 733.7	1.167	0,u^+	1	0	1	2	0	0	0	2	12	82
7 733.9	1.194	2,*g*	0	0	0	12	2	0	0	0	12	51
7 734.0	1.194	0,g^+	0	0	0	12	0	0	0	0	12	57
7 735.5	1.163	1,*u*	0	3	0	2	2	1	−1	3	12	70
7 737.4	1.167	2,*u*	1	0	1	2	2	0	0	2	12	89
7 738.2	1.183	1,*u*								1	12	<25
7 738.5	1.200	1,*g*	0	0	0	1	1	10	0	0	11	33
		1,*g*	0	0	0	1	−1	10	2	0	11	32
7 739.2	1.173	2,*g*	0	2	0	4	2	2	0	2	12	27
		2,*g*	0	2	0	4	0	2	2	2	12	33
7 741.1	1.195	2,*u*	0	0	0	9	5	3	−3	0	12	44

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7 744.5	1.195	$0,u^+$	0	0	0	9	3	3	−3	0	12	29
		$0,u^+$	0	0	0	11	1	1	−1	0	12	41
7 748.1	1.195	$0,u^-$	0	0	0	9	−1	3	1	0	12	35
		$0,u^-$	0	0	0	11	−1	1	1	0	12	33
7 750.0	1.196	$0,g^-$	0	0	0	8	−2	4	2	0	12	37
		$0,g^-$	0	0	0	10	−2	2	2	0	12	53
7 753.9	1.195	$2,u$	0	0	0	9	1	3	1	0	12	32
		$2,u$	0	0	0	11	3	1	−1	0	12	26
7 756.7	1.171	$2,g$	0	1	1	3	3	1	−1	2	12	70
7 757.2	1.195	$2,g$	0	0	0	10	0	2	2	0	12	30
7 758.0	1.184	$1,g$								1	12	<25
7 758.3	1.163	$1,u$	0	3	0	2	2	1	−1	3	12	26
		$1,u$	0	3	0	2	0	1	1	3	12	73
7 759.3	1.184	$1,g$								1	12	<25
7 759.7	1.171	$0,g^+$	0	1	1	3	1	1	−1	2	12	67
7 763.0	1.201	$1,u$	0	0	0	0	0	11	1	0	11	72
7 765.9	1.196	$2,g$	0	0	0	8	6	4	−4	0	12	53
7 766.4	1.183	$1,u$	1	0	0	6	0	1	1	1	12	29
		$1,u$	0	1	0	6	4	3	−3	1	12	29
7 770.5	1.182	$1,u$	1	0	0	6	2	1	−1	1	12	41
7 771.9	1.172	$0,g^-$	0	1	1	3	−1	1	1	2	12	76
7 772.5	1.196	$0,g^+$	0	0	0	8	4	4	−4	0	12	27
		$0,g^+$	0	0	0	10	2	2	−2	0	12	26
7 773.4	1.195	$0,u^-$	0	0	0	9	−3	3	3	0	12	45
		$0,u^-$	0	0	0	11	−1	1	1	0	12	29
7 773.8	1.174	$0,g^+$	0	2	0	4	2	2	−2	2	12	37
		$0,g^+$	0	2	0	4	0	2	0	2	12	56
7 776.7	1.172	$2,g$	0	1	1	3	1	1	1	2	12	45
		$2,g$	0	2	0	4	2	2	0	2	12	38
7 779.6	1.195	$2,u$	0	0	0	11	1	1	1	0	12	33
7 779.8	1.184	$1,u$	0	0	1	5	1	2	0	1	12	27
		$1,u$	0	1	0	6	−2	3	3	1	12	27
7 783.5	1.173	$2,g$	0	1	1	3	1	1	1	2	12	26
		$2,g$	0	2	0	4	0	2	2	2	12	54
7 784.7	1.184	$1,g$								1	12	<25
7 786.4	1.171	$0,u^+$								2	12	<25
7 791.3	1.160	$1,u$	0	2	1	1	1	0	0	3	12	93
7 794.9	1.182	$1,u$	1	0	0	6	0	1	1	1	12	40
7 795.9	1.196	$0,g^-$	0	0	0	8	−4	4	4	0	12	58
7 799.4	1.184	$1,g$	1	0	0	5	3	2	−2	1	12	28
7 800.5	1.197	$2,u$	0	0	0	7	7	5	−5	0	12	70
7 800.8	1.171	$2,u$	1	1	0	3	3	1	−1	2	12	38
7 801.5	1.170	$0,u^-$	0	0	2	1	−1	1	1	2	12	56
7 802.4	1.196	$2,g$								0	12	<25
7 804.5	1.170	$0,u^+$	0	0	2	1	1	1	−1	2	12	61
7 808.0	1.152	$0,g^+$	0	4	0	0	0	0	0	4	12	100
7 809.6	1.197	$0,u^+$	0	0	0	7	1	5	−1	0	12	26
7 813.0	1.184	$1,u$								1	12	<25
7 813.3	1.196	$0,g^+$	0	0	0	8	0	4	0	0	12	26
7 814.7	1.169	$2,u$	0	0	2	1	1	1	1	2	12	51
		$2,u$	1	1	0	3	3	1	−1	2	12	33
7 816.3	1.172	$0,u^+$	1	1	0	3	1	1	−1	2	12	59
7 817.0	1.172	$0,u^-$	0	0	2	1	−1	1	1	2	12	30
		$0,u^-$	0	2	0	3	−3	3	3	2	12	51
7 817.3	1.196	$0,u^+$								0	12	<25
7 819.1	1.184	$1,g$								1	12	<25
7 819.4	1.196	$2,g$								0	12	<25
7 822.5	1.196	$2,u$	0	0	0	9	−1	3	3	0	12	29
7 824.0	1.184	$1,g$	0	0	1	4	4	3	−3	1	12	27
7 826.1	1.172	$2,u$								2	12	<25
7 829.4	1.183	$1,g$	1	0	0	5	3	2	−2	1	12	37
7 829.8	1.197	$0,u^-$	0	0	0	7	−5	5	5	0	12	61
7 834.1	1.171	$0,u^-$	1	1	0	3	−1	1	1	2	12	80
7 835.0	1.168	$0,g^+$	1	0	1	1	1	1	−1	2	12	85

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7 835.5	1.197	2,u								0	12	<25
7 836.9	1.171	2,u	1	1	0	3	1	1	1	2	12	59
7 837.9	1.196	0,g^+	0	0	0	8	4	4	−4	0	12	40
7 840.4	1.184	1,u								1	12	<25
7 841.3	1.174	0,u^+	0	2	0	3	3	3	−3	2	12	36
		0,u^+	0	2	0	3	1	3	−1	2	12	42
7 844.0	1.196	2,g	0	0	0	8	−2	4	4	0	12	27
7 846.1	1.185	1,u	0	1	0	6	0	3	1	1	12	33
7 850.1	1.183	1,g	1	0	0	5	−1	2	2	1	12	29
7 852.4	1.174	2,u	0	2	0	3	−1	3	3	2	12	44
7 852.4	1.168	0,g^-	1	0	1	1	−1	1	1	2	12	96
7 853.4	1.168	2,g	1	0	1	1	1	1	1	2	12	82
7 855.1	1.159	1,g	1	2	0	1	1	0	0	3	12	91
7 856.0	1.184	1,g								1	12	<25
7 858.1	1.172	0,u^+	0	1	1	2	2	2	−2	2	12	47
7 861.1	1.198	0,g^+	0	0	0	6	6	6	−6	0	12	27
		0,g^+	0	0	0	6	4	6	−4	0	12	26
7 862.7	1.197	0,u^+	0	0	0	7	5	5	−5	0	12	53
7 865.4	1.183	1,u	1	0	0	4	4	3	−3	1	12	39
7 866.4	1.172	0,u^-	0	1	1	2	−2	2	2	2	12	74
7 869.7	1.197	2,u	0	0	0	7	−3	5	5	0	12	27
7 870.4	1.185	1,g								1	12	<25
7 872.9	1.172	2,u	0	1	1	2	2	2	0	2	12	64
7 875.0	1.198	0,g^-	0	0	0	6	−6	6	6	0	12	65
7 876.5	1.198	2,g	0	0	0	6	6	6	−4	0	12	26
7 877.0	1.163	1,g	0	3	0	1	1	2	0	3	12	37
		1,g	0	3	0	1	−1	2	2	3	12	52
7 878.9	1.182	1,g	1	0	0	5	1	2	0	1	12	28
7 881.6	1.185	1,u								1	12	<25
7 882.0	1.172	0,u^+	0	1	1	2	2	2	−2	2	12	26
		0,u^+	0	1	1	2	0	2	0	2	12	54
7 882.7	1.196	0,u^-	0	0	0	7	−1	5	1	0	12	35
		0,u^-	0	0	0	11	−1	1	1	0	12	25
7 883.8	1.175	0,u^-	0	2	0	3	−1	3	1	2	12	83
7 888.0	1.197	0,g^-	0	0	0	6	−2	6	2	0	12	29
7 889.0	1.174	2,u	0	1	1	2	0	2	2	2	12	33
		2,u	0	2	0	3	1	3	1	2	12	37
7 889.2	1.184	1,u								1	12	<25
7 889.2	1.196	2,u								0	12	<25
7 890.3	1.166	0,g^+	2	0	0	2	0	0	0	2	12	87
7 892.5	1.166	2,g	2	0	0	2	2	0	0	2	12	84
7 894.4	1.197	2,g								0	12	<25
7 896.0	1.174	2,u	0	1	1	2	0	2	2	2	12	30
		2,u	0	2	0	3	−1	3	3	2	12	36
7 896.2	1.164	1,g	0	3	0	1	1	2	0	3	12	56
		1,g	0	3	0	1	−1	2	2	3	12	42
7 897.2	1.198	0,g^+	0	0	0	6	6	6	−6	0	12	62
7 899.6	1.172	0,g^+	1	1	0	2	2	2	−2	2	12	33
7 901.3	1.184	1,g	0	0	1	4	0	3	1	1	12	27
7 906.1	1.198	2,g	0	0	0	6	6	6	−4	0	12	28
7 907.9	1.197	0,u^-								0	12	<25
7 909.6	1.185	1,u	1	0	0	4	−2	3	3	1	12	27
		1,u	0	1	0	4	4	5	−3	1	12	25
7 912.8	1.184	1,u	0	0	1	3	3	4	−2	1	12	31
7 914.8	1.197	2,u	0	0	0	7	−3	5	5	0	12	27
7 917.0	1.172	2,g	1	1	0	2	2	2	0	2	12	34
7 919.2	1.171	0,g^-	1	1	0	2	−2	2	2	2	12	88
7 920.1	1.184	1,u								1	12	<25
7 921.5	1.170	0,g^+	0	0	2	0	0	2	0	2	12	67
7 930.6	1.199	0,u^+	0	0	0	5	1	7	−1	0	12	30
7 930.6	1.174	0,g^+	0	2	0	2	2	4	−2	2	12	34
		0,g^+	0	2	0	2	0	4	0	2	12	25
7 932.6	1.161	1,g	0	2	1	0	0	1	1	3	12	93
7 933.1	1.198	0,g^-	0	0	0	6	−6	6	6	0	12	28

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,g^-$	0	0	0	6	−4	6	4	0	12	28
7 933.9	1.184	$1,u$								1	12	<25
7 935.1	1.184	$1,g$								1	12	<25
7 935.2	1.170	$2,g$	0	0	2	0	0	2	2	2	12	58
7 937.0	1.186	$1,g$	0	1	0	5	1	4	0	1	12	29
7 941.4	1.198	$2,g$	0	0	0	6	−4	6	6	0	12	36
7 944.5	1.171	$0,g^+$	1	1	0	2	2	2	−2	2	12	28
		$0,g^+$	1	1	0	2	0	2	0	2	12	60
7 945.1	1.173	$2,g$								2	12	<25
7 945.8	1.185	$1,u$								1	12	<25
7 947.1	1.199	$2,u$								0	12	<25
7 951.9	1.172	$2,g$	1	1	0	2	0	2	2	2	12	61
7 953.4	1.175	$0,g^-$	0	2	0	2	−2	4	2	2	12	79
7 956.8	1.197	$0,g^+$								0	12	<25
7 961.7	1.185	$1,u$								1	12	<25
7 961.9	1.168	$0,u^+$	1	0	1	0	0	2	0	2	12	82
7 962.2	1.198	$0,u^+$								0	12	<25
7 964.0	1.197	$2,g$								0	12	<25
7 964.0	1.199	$0,u^-$	0	0	0	5	−5	7	5	0	12	58
7 966.1	1.183	$1,u$	1	0	0	4	0	3	1	1	12	31
7 966.5	1.175	$2,g$	0	2	0	2	2	4	0	2	12	29
		$2,g$	0	2	0	2	−2	4	4	2	12	42
7 968.3	1.183	$1,g$	1	0	0	3	3	4	−2	1	12	28
		$1,g$	1	0	0	3	−3	4	4	1	12	36
7 969.2	1.198	$2,u$								0	12	<25
7 975.0	1.173	$0,g^+$	0	1	1	1	1	3	−1	2	12	76
7 976.6	1.168	$2,u$	1	0	1	0	0	2	2	2	12	85
7 977.5	1.186	$1,g$								1	12	<25
7 979.5	1.199	$2,u$	0	0	0	5	−5	7	7	0	12	42
7 979.9	1.198	$0,g^+$	0	0	0	6	4	6	−4	0	12	35
7 988.4	1.198	$2,g$								0	12	<25
7 990.2	1.173	$2,g$	0	1	1	1	1	3	1	2	12	51
		$2,g$	0	1	1	1	−1	3	3	2	12	26
7 990.6	1.185	$1,u$								1	12	<25
7 993.0	1.173	$0,g^-$	0	1	1	1	−1	3	1	2	12	84
7 994.7	1.167	$0,u^+$	2	0	0	1	1	1	−1	2	12	79
7 995.2	1.176	$0,g^+$	0	2	0	2	2	4	−2	2	12	40
		$0,g^+$	0	2	0	2	0	4	0	2	12	54
7 997.8	1.184	$1,g$	1	0	0	3	−3	4	4	1	12	31
7 998.5	1.160	$1,u$	1	2	0	0	0	1	1	3	12	94
8 001.3	1.199	$0,u^+$	0	0	0	5	5	7	−5	0	12	60
8 001.6	1.167	$0,u^-$	2	0	0	1	−1	1	1	2	12	90
8 002.1	1.175	$2,g$	0	2	0	2	2	4	0	2	12	29
		$2,g$	0	2	0	2	0	4	2	2	12	30
8 006.8	1.186	$1,g$	0	1	0	3	−3	6	4	1	12	29
8 009.5	1.174	$2,g$	0	1	1	1	−1	3	3	2	12	25
		$2,g$	0	2	0	2	0	4	2	2	12	27
8 010.8	1.200	$0,g^+$	0	0	0	4	4	8	−4	0	12	27
		$0,g^+$	0	0	0	4	2	8	−2	0	12	33
8 012.2	1.199	$2,u$	0	0	0	5	−5	7	7	0	12	34
8 013.6	1.184	$1,g$								1	12	<25
8 013.7	1.167	$2,u$	2	0	0	1	1	1	1	2	12	82
8 025.7	1.200	$2,g$								0	12	<25
8 026.0	1.172	$0,u^+$	1	1	0	1	1	3	−1	2	12	74
8 028.4	1.187	$1,u$	0	1	0	4	0	5	1	1	12	30
8 033.1	1.198	$0,u^-$	0	0	0	5	−1	7	1	0	12	35
8 033.9	1.185	$1,g$	0	0	1	2	−2	5	3	1	12	27
8 036.5	1.165	$1,u$	0	3	0	0	0	3	1	3	12	95
8 036.8	1.198	$0,g^-$	0	0	0	4	−2	8	2	0	12	35
8 041.0	1.198	$2,u$								0	12	<25
8 041.4	1.172	$2,u$	1	1	0	1	1	3	1	2	12	41
		$2,u$	1	1	0	1	−1	3	3	2	12	34
8 042.7	1.185	$1,u$	1	0	0	2	0	5	1	1	12	26
8 046.0	1.198	$2,g$								0	12	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8 050.4	1.185	1,*g*								1	12	<25
8 051.7	1.199	0,u^-								0	12	<25
8 053.9	1.185	1,*g*	1	0	0	3	1	4	0	1	12	26
8 056.1	1.172	0,u^-	1	1	0	1	−1	3	1	2	12	93
8 060.9	1.199	2,*u*								0	12	<25
8 063.2	1.199	0,g^-	0	0	0	4	−4	8	4	0	12	64
8 063.6	1.176	0,u^+	0	2	0	1	1	5	−1	2	12	74
8 067.5	1.172	2,*u*	1	1	0	1	1	3	1	2	12	33
		2,*u*	1	1	0	1	−1	3	3	2	12	59
8 076.1	1.200	2,*g*	0	0	0	4	−4	8	6	0	12	39
8 077.9	1.186	1,*g*	0	0	1	2	0	5	1	1	12	31
8 077.9	1.176	2,*u*	0	2	0	1	1	5	1	2	12	30
		2,*u*	0	2	0	1	−1	5	3	2	12	44
8 087.3	1.185	1,*u*	1	0	0	2	−2	5	3	1	12	49
8 088.7	1.186	1,*u*	1	0	0	2	2	5	−1	1	12	40
8 099.0	1.200	0,u^+	0	0	0	3	1	9	−1	0	12	62
8 101.7	1.174	0,u^+	0	1	1	0	0	4	0	2	12	87
8 105.6	1.177	0,u^-	0	2	0	1	−1	5	1	2	12	94
8 107.9	1.199	0,g^+	0	0	0	4	0	8	0	0	12	26
8 113.2	1.199	0,u^+	0	0	0	3	3	9	−3	0	12	39
8 113.3	1.175	2,*u*	0	1	1	0	0	4	2	2	12	54
		2,*u*	0	2	0	1	1	5	1	2	12	39
8 113.6	1.186	1,*u*	0	0	1	1	1	6	0	1	12	27
		1,*u*	0	0	1	1	−1	6	2	1	12	36
8 113.7	1.200	2,*u*	0	0	0	3	−1	9	3	0	12	37
8 115.6	1.168	0,g^+	2	0	0	0	0	2	0	2	12	89
8 117.5	1.199	2,*g*								0	12	<25
8 118.4	1.188	1,*g*	0	1	0	3	1	6	0	1	12	29
		1,*g*	0	1	0	3	−1	6	2	1	12	27
8 118.8	1.199	0,g^+	0	0	0	4	4	8	−4	0	12	38
8 119.9	1.175	2,*u*	0	1	1	0	0	4	2	2	12	32
		2,*u*	0	2	0	1	−1	5	3	2	12	44
8 122.6	1.199	2,*u*	0	0	0	3	3	9	−1	0	12	25
8 128.8	1.199	2,*g*								0	12	<25
8 129.9	1.168	2,*g*	2	0	0	0	0	2	2	2	12	90
8 135.4	1.186	1,*u*								1	12	<25
8 139.3	1.185	1,*u*	1	0	0	2	0	5	1	1	12	39
8 159.9	1.186	1,*u*	0	0	1	1	1	6	0	1	12	30
		1,*u*	0	0	1	1	−1	6	2	1	12	32
8 162.2	1.185	1,*g*	1	0	0	1	1	6	0	1	12	37
		1,*g*	1	0	0	1	−1	6	2	1	12	37
8 165.3	1.173	0,g^+	1	1	0	0	0	4	0	2	12	86
8 171.4	1.200	0,u^-	0	0	0	3	−3	9	3	0	12	48
8 179.2	1.173	2,*g*	1	1	0	0	0	4	2	2	12	87
8 180.5	1.200	0,g^-	0	0	0	2	−2	10	2	0	12	31
8 184.1	1.200	2,*u*	0	0	0	3	−3	9	5	0	12	32
8 188.5	1.199	0,u^-	0	0	0	7	−1	5	1	0	12	27
8 190.4	1.200	2,*g*								0	12	<25
8 197.1	1.199	2,*u*								0	12	<25
8 200.4	1.174	1,*g*	0	2	0	7	1	0	0	2	13	88
8 203.1	1.201	0,g^+	0	0	0	2	2	10	−2	0	12	41
		0,g^+	0	0	0	2	0	10	0	0	12	36
8 204.2	1.189	1,*u*	0	1	0	2	0	7	1	1	12	41
8 210.8	1.188	1,*g*	0	1	0	1	1	8	0	1	12	32
		1,*g*	0	1	0	1	−1	8	2	1	12	33
8 212.4	1.177	0,g^+	0	2	0	0	0	6	0	2	12	89
8 217.5	1.201	2,*g*	0	0	0	2	0	10	2	0	12	35
		2,*g*	0	0	0	2	−2	10	4	0	12	28
8 220.9	1.185	1,*g*	1	0	0	1	1	6	0	1	12	44
		1,*g*	1	0	0	1	−1	6	2	1	12	43
8 223.6	1.163	0,g^+	0	3	0	4	0	0	0	3	13	98
8 225.7	1.177	2,*g*	0	2	0	0	0	6	2	2	12	90
8 226.6	1.163	2,*g*	0	3	0	4	2	0	0	3	13	98
8 231.7	1.187	1,*g*	0	0	1	0	0	7	1	1	12	72

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8 241.4	1.201	$0,u^+$	0	0	0	1	1	11	−1	0	12	28
		$0,u^+$	0	0	0	3	3	9	−3	0	12	30
8 241.5	1.173	$1,u$	0	1	1	5	1	0	0	2	13	29
		$1,u$	0	2	0	6	2	1	−1	2	13	38
8 249.3	1.183	$0,u^+$	0	0	1	8	0	0	0	1	13	40
		$0,u^+$	0	1	0	9	1	1	−1	1	13	29
8 249.5	1.183	$0,g^+$	0	1	0	10	0	0	0	1	13	38
8 252.7	1.183	$2,u$	0	0	1	8	2	0	0	1	13	41
8 252.9	1.201	$2,u$								0	12	<25
8 253.2	1.183	$2,g$	0	1	0	10	2	0	0	1	13	39
8 259.1	1.200	$0,g^+$								0	12	<25
8 268.4	1.200	$2,g$								0	12	<25
8 283.0	1.189	$1,g$	0	1	0	1	1	8	0	1	12	43
		$1,g$	0	1	0	1	−1	8	2	1	12	43
8 284.0	1.172	$1,u$	0	1	1	5	1	0	0	2	13	54
		$1,u$	0	2	0	6	2	1	−1	2	13	32
8 284.5	1.184	$0,g^+$	0	0	1	7	1	1	−1	1	13	31
		$0,g^+$	0	1	0	10	0	0	0	1	13	34
8 286.3	1.184	$2,g$	0	1	0	10	2	0	0	1	13	32
8 287.8	1.170	$1,g$	0	0	2	3	1	0	0	2	13	54
8 291.8	1.174	$1,u$	0	2	0	6	0	1	1	2	13	64
8 293.7	1.186	$1,u$	1	0	0	0	0	7	1	1	12	88
8 296.2	1.183	$0,u^+$	0	0	1	8	0	0	0	1	13	51
		$0,u^+$	0	1	0	9	1	1	−1	1	13	29
8 297.5	1.201	$0,g^-$	0	0	0	2	−2	10	2	0	12	64
8 297.8	1.183	$2,u$	0	0	1	8	2	0	0	1	13	49
		$2,u$	0	1	0	9	3	1	−1	1	13	26
8 309.4	1.201	$2,g$	0	0	0	2	2	10	0	0	12	27
		$2,g$	0	0	0	2	−2	10	4	0	12	37
8 312.1	1.173	$1,g$	0	2	0	5	3	2	−2	2	13	28
8 316.5	1.185	$0,u^-$	0	1	0	9	−1	1	1	1	13	57
8 318.8	1.202	$0,u^+$	0	0	0	1	1	11	−1	0	12	68
8 319.4	1.164	$0,u^+$	0	3	0	3	1	1	−1	3	13	90
8 319.6	1.184	$0,u^+$	0	0	1	6	2	2	−2	1	13	26
		$0,u^+$	0	1	0	9	1	1	−1	1	13	26
8 320.4	1.164	$2,u$	0	3	0	3	3	1	−1	3	13	78
8 320.4	1.184	$2,u$	0	0	1	6	4	2	−2	1	13	26
8 322.2	1.185	$2,u$	0	1	0	9	1	1	1	1	13	44
8 322.5	1.184	$0,g^-$	0	0	1	7	−1	1	1	1	13	41
		$0,g^-$	0	1	0	8	−2	2	2	1	13	34
8 322.7	1.184	$2,g$	0	1	0	8	4	2	−2	1	13	35
8 323.2	1.184	$0,g^+$								1	13	<25
8 325.2	1.201	$0,u^-$	0	0	0	1	−1	11	1	0	12	41
		$0,u^-$	0	0	0	5	−1	7	1	0	12	25
8 329.5	1.184	$2,g$	0	0	1	7	3	1	−1	1	13	30
8 330.5	1.202	$2,u$	0	0	0	1	1	11	1	0	12	53
8 333.3	1.169	$1,u$	1	0	1	3	1	0	0	2	13	66
8 336.9	1.201	$2,u$	0	0	0	1	−1	11	3	0	12	44
8 339.2	1.173	$1,g$	1	1	0	5	1	0	0	2	13	26
		$1,g$	0	2	0	5	3	2	−2	2	13	32
8 343.9	1.197	$1,g$								0	13	<25
8 343.9	1.197	$1,u$	0	0	0	10	2	3	−1	0	13	27
8 344.1	1.173	$1,g$	1	1	0	5	1	0	0	2	13	40
		$1,g$	0	2	0	5	−1	2	2	2	13	26
8 347.1	1.164	$0,u^-$	0	3	0	3	−1	1	1	3	13	99
8 348.1	1.190	$1,u$	0	1	0	0	0	9	1	1	12	87
8 353.0	1.164	$2,u$	0	3	0	3	1	1	1	3	13	80
8 355.9	1.185	$0,u^-$	0	0	1	6	−2	2	2	1	13	42
		$0,u^-$	0	1	0	7	−3	3	3	1	13	27
8 357.6	1.185	$2,u$	0	1	0	7	5	3	−3	1	13	33
8 359.2	1.183	$2,g$	1	0	0	8	2	0	0	1	13	42
8 363.0	1.182	$0,g^+$	1	0	0	8	0	0	0	1	13	58
8 363.4	1.185	$0,u^+$	1	0	0	7	1	1	−1	1	13	28
		$0,u^+$	0	1	0	7	1	3	−1	1	13	32

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8 364.1	1.184	$0,g^-$	0	0	1	7	−1	1	1	1	13	46
		$0,g^-$	0	1	0	8	−2	2	2	1	13	39
8 365.7	1.185	$2,u$								1	13	<25
8 367.8	1.153	$1,g$	0	4	0	1	1	0	0	4	13	100
8 368.6	1.172	$1,g$	0	1	1	4	2	1	−1	2	13	49
8 369.6	1.185	$0,g^+$	0	0	1	5	1	3	−1	1	13	25
8 370.7	1.185	$2,g$	0	0	1	5	5	3	−3	1	13	29
8 373.2	1.183	$2,g$	0	0	1	7	1	1	1	1	13	36
8 376.2	1.161	$0,u^+$	0	2	1	2	0	0	0	3	13	90
8 378.1	1.173	$1,u$								2	13	<25
8 379.1	1.161	$2,u$	0	2	1	2	2	0	0	3	13	91
8 379.5	1.202	$0,g^+$	0	0	0	0	0	12	0	0	12	45
8 384.4	1.173	$1,g$	0	1	1	4	0	1	1	2	13	50
8 390.9	1.202	$2,g$	0	0	0	0	0	12	2	0	12	43
8 391.7	1.175	$1,g$	0	2	0	5	1	2	0	2	13	42
		$1,g$	0	2	0	5	−1	2	2	2	13	37
8 392.5	1.197	$1,g$	0	0	0	9	3	4	−2	0	13	25
8 392.8	1.197	$1,u$	0	0	0	10	4	3	−3	0	13	27
8 394.4	1.184	$2,u$								1	13	<25
8 395.0	1.186	$0,g^+$	0	1	0	8	0	2	0	1	13	28
8 395.9	1.185	$0,u^-$	0	1	0	7	−3	3	3	1	13	38
8 396.5	1.171	$1,u$	0	0	2	2	2	1	−1	2	13	49
8 398.6	1.197	$1,u$	0	0	0	12	2	1	−1	0	13	29
8 399.1	1.197	$1,g$	0	0	0	9	−1	4	2	0	13	29
8 399.2	1.185	$0,g^-$	0	0	1	5	−3	3	3	1	13	43
8 399.7	1.172	$1,u$	0	0	2	2	0	1	1	2	13	32
		$1,u$	0	2	0	4	4	3	−3	2	13	27
8 400.2	1.185	$2,g$								1	13	<25
8 401.6	1.185	$2,g$	0	1	0	8	2	2	0	1	13	26
8 402.2	1.183	$0,u^+$	1	0	0	7	1	1	−1	1	13	51
8 403.1	1.184	$2,u$	1	0	0	7	3	1	−1	1	13	31
8 405.1	1.185	$0,u^+$	0	0	1	6	2	2	−2	1	13	26
8 412.5	1.185	$2,u$	0	0	1	6	2	2	0	1	13	27
		$2,u$	0	1	0	7	−1	3	3	1	13	29
8 414.0	1.172	$1,u$	0	0	2	2	0	1	1	2	13	26
		$1,u$	0	2	0	4	4	3	−3	2	13	25
8 414.6	1.185	$2,g$	1	0	0	6	4	2	−2	1	13	26
8 416.2	1.185	$0,g^+$								1	13	<25
8 418.0	1.197	$1,g$	0	0	0	11	3	2	−2	0	13	29
8 420.0	1.173	$1,u$	1	1	0	4	2	1	−1	2	13	29
8 421.2	1.169	$1,g$	1	0	1	2	2	1	−1	2	13	51
		$1,g$	1	0	1	2	0	1	1	2	13	25
8 427.8	1.163	$0,g^+$	1	2	0	2	0	0	0	3	13	37
		$0,g^+$	0	3	0	2	2	2	−2	3	13	27
8 428.2	1.197	$1,u$	0	0	0	12	0	1	1	0	13	30
8 428.9	1.183	$0,u^-$	1	0	0	7	−1	1	1	1	13	58
8 432.3	1.183	$2,u$	1	0	0	7	1	1	1	1	13	44
8 434.9	1.185	$0,u^+$								1	13	<25
8 437.5	1.161	$2,g$	1	2	0	2	2	0	0	3	13	84
8 437.8	1.201	$0,u^-$	0	0	0	1	−1	11	1	0	12	51
		$0,u^-$	0	0	0	3	−1	9	1	0	12	32
8 439.4	1.186	$0,g^+$	0	0	1	5	3	3	−3	1	13	33
8 440.1	1.185	$2,g$	0	1	0	6	6	4	−4	1	13	29
8 440.2	1.198	$1,g$	0	0	0	11	−1	2	2	0	13	30
8 440.8	1.198	$1,u$	0	0	0	8	6	5	−5	0	13	35
8 440.9	1.186	$0,g^-$	1	0	0	6	−2	2	2	1	13	30
		$0,g^-$	0	1	0	6	−4	4	4	1	13	38
8 441.1	1.185	$2,g$								1	13	<25
8 441.3	1.173	$1,u$	1	1	0	4	0	1	1	2	13	43
8 442.4	1.162	$0,g^+$	1	2	0	2	0	0	0	3	13	54
		$0,g^+$	0	3	0	2	2	2	−2	3	13	33
8 443.0	1.185	$0,u^+$								1	13	<25
8 445.6	1.169	$1,g$	1	0	1	2	2	1	−1	2	13	37
		$1,g$	1	0	1	2	0	1	1	2	13	48

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8 447.6	1.185	2,*u*								1	13	<25
8 447.7	1.175	1,*u*	0	2	0	4	−2	3	3	2	13	34
8 448.7	1.165	0,g^-	0	3	0	2	−2	2	2	3	13	92
8 448.8	1.201	2,*u*	0	0	0	1	1	11	1	0	12	27
		2,*u*	0	0	0	1	−1	11	3	0	12	25
8 449.8	1.202	0,g^+	0	0	0	0	0	12	0	0	12	50
8 451.3	1.185	2,*u*	0	0	1	6	0	2	2	1	13	28
8 452.0	1.185	2,*g*								1	13	<25
8 453.2	1.184	0,g^+	1	0	0	6	2	2	−2	1	13	27
8 454.2	1.173	1,*u*	0	1	1	3	3	2	−2	2	13	49
8 457.6	1.164	2,*g*	0	3	0	2	2	2	0	3	13	52
		2,*g*	0	3	0	2	0	2	2	3	13	30
8 458.1	1.186	0,u^-	0	0	1	4	−4	4	4	1	13	37
8 461.5	1.198	1,*u*	0	0	0	10	−2	3	3	0	13	26
8 461.9	1.202	2,*g*	0	0	0	0	0	12	2	0	12	53
8 462.8	1.198	1,*g*								0	13	<25
8 467.5	1.198	1,*u*								0	13	<25
8 467.9	1.159	0,g^+	0	1	2	0	0	0	0	3	13	80
8 471.4	1.173	1,*u*	0	1	1	3	−1	2	2	2	13	30
8 473.1	1.184	0,g^-	1	0	0	6	−2	2	2	1	13	48
		0,g^-	0	0	1	5	−3	3	3	1	13	29
8 474.3	1.184	2,*u*	1	0	0	5	5	3	−3	1	13	51
8 476.3	1.184	2,*g*	1	0	0	6	0	2	2	1	13	28
8 476.6	1.165	0,g^+	0	3	0	2	2	2	−2	3	13	33
		0,g^+	0	3	0	2	0	2	0	3	13	64
8 477.9	1.186	0,g^+	0	1	0	6	4	4	−4	1	13	29
8 478.7	1.186	0,u^-	0	1	0	7	−1	3	1	1	13	40
8 478.9	1.199	1,*g*	0	0	0	7	7	6	−6	0	13	47
8 479.5	1.186	0,u^+	0	1	0	5	5	5	−5	1	13	33
8 481.7	1.173	1,*g*								2	13	<25
8 484.8	1.165	2,*g*	0	3	0	2	2	2	0	3	13	37
		2,*g*	0	3	0	2	0	2	2	3	13	61
8 485.4	1.185	2,*g*								1	13	<25
8 485.7	1.186	2,*u*	0	1	0	7	1	3	1	1	13	26
8 487.3	1.186	0,u^+	0	0	1	4	4	4	−4	1	13	33
8 489.2	1.174	1,*u*	0	1	1	3	1	2	0	2	13	34
		1,*u*	0	1	1	3	−1	2	2	2	13	32
8 489.9	1.197	1,*g*								0	13	<25
8 490.1	1.168	1,*g*	2	0	0	3	1	0	0	2	13	72
8 490.8	1.186	2,*u*	0	1	0	5	5	5	−3	1	13	29
8 491.9	1.186	0,g^-	0	0	1	5	−1	3	1	1	13	28
8 496.6	1.176	1,*u*	0	2	0	4	0	3	1	2	13	46
8 497.1	1.186	0,u^-	1	0	0	5	−3	3	3	1	13	36
		0,u^-	0	1	0	5	−5	5	5	1	13	38
8 499.9	1.186	2,*g*	0	1	0	6	−2	4	4	1	13	26
8 500.9	1.199	1,*g*								0	13	<25
8 501.7	1.172	1,*g*	1	1	0	3	3	2	−2	2	13	36
8 502.1	1.162	0,g^+	0	2	1	1	1	1	−1	3	13	80
8 502.4	1.198	1,*u*								0	13	<25
8 504.9	1.186	2,*u*								1	13	<25
8 506.7	1.183	0,g^+	1	0	0	6	0	2	0	1	13	35
8 506.9	1.162	0,g^-	0	2	1	1	−1	1	1	3	13	92
8 509.7	1.172	1,*g*	0	0	2	1	1	2	0	2	13	52
8 511.6	1.158	0,u^+	1	1	1	0	0	0	0	3	13	95
8 512.8	1.184	2,*g*	1	0	0	6	0	2	2	1	13	30
8 513.1	1.173	1,*g*	0	0	2	1	−1	2	2	2	13	32
8 514.9	1.185	0,u^+								1	13	<25
8 515.7	1.162	2,*g*	0	2	1	1	1	1	1	3	13	90
8 517.7	1.186	0,g^+								1	13	<25
8 520.4	1.173	1,*g*	1	1	0	3	−1	2	2	2	13	27
8 523.6	1.186	0,u^-	0	0	1	4	−4	4	4	1	13	50
8 524.6	1.186	0,u^+	0	1	0	5	5	5	−5	1	13	32
8 526.8	1.186	0,g^-	0	0	1	5	−1	3	1	1	13	36
8 527.4	1.174	1,*g*	0	2	0	3	−3	4	4	2	13	36

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8 527.6	1.186	2,u	0	1	0	5	5	5	−3	1	13	26
8 528.9	1.199	1,g								0	13	<25
8 529.1	1.185	2,u	0	0	1	4	4	4	−2	1	13	35
8 529.3	1.186	0,u^-	1	0	0	5	−3	3	3	1	13	25
		0,u^-	0	0	1	4	−2	4	2	1	13	33
8 531.1	1.198	1,u								0	13	<25
8 532.1	1.154	1,u	0	4	0	0	0	1	1	4	13	100
8 532.8	1.199	1,g								0	13	<25
8 533.2	1.170	1,u	1	0	1	1	1	2	0	2	13	43
		1,u	1	0	1	1	−1	2	2	2	13	33
8 533.9	1.186	2,g								1	13	<25
8 535.9	1.186	2,g								1	13	<25
8 541.5	1.186	2,u	0	1	0	5	−3	5	5	1	13	29
8 543.6	1.200	1,u								0	13	<25
8 547.5	1.173	1,g	1	1	0	3	1	2	0	2	13	30
		1,g	1	1	0	3	−1	2	2	2	13	35
8 547.9	1.185	0,g^-	1	0	0	4	−4	4	4	1	13	45
8 551.3	1.185	0,u^+								1	13	<25
8 553.9	1.198	1,u								0	13	<25
8 554.7	1.176	1,g								2	13	<25
8 556.1	1.162	0,u^+	1	2	0	1	1	1	−1	3	13	78
8 557.9	1.170	1,u	1	0	1	1	1	2	0	2	13	34
		1,u	1	0	1	1	−1	2	2	2	13	54
8 559.2	1.185	2,u	1	0	0	5	−1	3	3	1	13	30
8 560.8	1.186	0,g^+	1	0	0	4	4	4	−4	1	13	36
8 562.4	1.174	1,g	0	1	1	2	2	3	−1	2	13	26
		1,g	0	1	1	2	0	3	1	2	13	27
8 563.4	1.186	0,u^-								1	13	<25
8 566.0	1.187	0,g^+								1	13	<25
8 566.9	1.186	2,g	1	0	0	4	4	4	−2	1	13	28
8 568.0	1.200	1,u	0	0	0	6	−6	7	7	0	13	40
8 569.1	1.199	1,g								0	13	<25
8 569.7	1.161	0,u^-	1	2	0	1	−1	1	1	3	13	96
8 571.9	1.186	2,u								1	13	<25
8 574.0	1.187	2,g								1	13	<25
8 574.2	1.162	2,u	1	2	0	1	1	1	1	3	13	82
8 576.3	1.174	1,g	0	1	1	2	2	3	−1	2	13	31
		1,g	0	1	1	2	−2	3	3	2	13	40
8 576.7	1.186	0,g^+	1	0	0	4	4	4	−4	1	13	41
8 580.0	1.187	0,g^-	1	0	0	4	−4	4	4	1	13	35
		0,g^-	0	1	0	4	−4	6	4	1	13	29
8 580.3	1.187	0,u^+								1	13	<25
8 581.8	1.187	2,g								1	13	<25
8 581.8	1.168	1,u	2	0	0	2	2	1	−1	2	13	67
8 583.0	1.165	0,u^+	0	3	0	1	1	3	−1	3	13	80
8 588.8	1.186	2,u								1	13	<25
8 589.4	1.184	0,u^-	1	0	0	5	−1	3	1	1	13	50
8 594.8	1.200	1,u	0	0	0	6	6	7	−5	0	13	28
		1,u	0	0	0	6	−6	7	7	0	13	28
8 596.1	1.175	1,g	0	1	1	2	0	3	1	2	13	45
8 596.6	1.186	2,g	1	0	0	4	4	4	−2	1	13	29
		2,g	0	1	0	4	−4	6	6	1	13	27
8 597.1	1.165	2,u	0	3	0	1	1	3	1	3	13	30
		2,u	0	3	0	1	−1	3	3	3	13	52
8 597.3	1.174	1,u								2	13	<25
8 597.7	1.185	2,u	1	0	0	5	1	3	1	1	13	26
8 599.3	1.168	1,u	2	0	0	2	0	1	1	2	13	72
8 600.1	1.186	0,g^+	0	0	1	3	3	5	−3	1	13	36
8 603.6	1.199	1,g								0	13	<25
8 603.7	1.177	1,g	0	2	0	3	1	4	0	2	13	34
		1,g	0	2	0	3	−1	4	2	2	13	38
8 604.9	1.199	1,u								0	13	<25
8 609.2	1.187	0,g^-	0	1	0	4	−4	6	4	1	13	27
8 609.4	1.166	0,u^-	0	3	0	1	−1	3	1	3	13	96

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8 612.6	1.187	$0,u^+$	0	0	1	4	0	4	0	1	13	26
8 613.0	1.201	$1,g$								0	13	<25
8 614.2	1.186	$0,u^+$								1	13	<25
8 614.3	1.186	$2,g$								1	13	<25
8 615.6	1.187	$0,g^+$	0	1	0	4	4	6	−4	1	13	34
8 617.0	1.187	$2,g$								1	13	<25
8 619.9	1.166	$2,u$	0	3	0	1	1	3	1	3	13	60
		$2,u$	0	3	0	1	−1	3	3	3	13	37
8 622.7	1.186	$2,u$								1	13	<25
8 623.8	1.199	$1,g$								0	13	<25
8 624.7	1.173	$1,u$	1	1	0	2	2	3	−1	2	13	39
		$1,u$	1	1	0	2	−2	3	3	2	13	40
8 625.4	1.172	$1,u$	0	0	2	0	0	3	1	2	13	58
8 630.0	1.186	$2,u$								1	13	<25
8 630.4	1.185	$0,g^-$	1	0	0	4	−2	4	2	1	13	44
		$0,g^-$	0	0	1	3	−3	5	3	1	13	32
8 631.4	1.187	$2,g$	0	1	0	4	−4	6	6	1	13	32
8 633.3	1.176	$1,u$								2	13	<25
8 638.0	1.200	$1,u$								0	13	<25
8 640.1	1.163	$0,u^+$	0	2	1	0	0	2	0	3	13	93
8 641.7	1.186	$2,g$	1	0	0	4	−2	4	4	1	13	25
8 648.6	1.187	$0,g^+$	0	1	0	4	4	6	−4	1	13	28
8 653.8	1.188	$0,u^-$								1	13	<25
8 654.6	1.163	$2,u$	0	2	1	0	0	2	2	3	13	91
8 655.5	1.174	$1,u$	1	1	0	2	0	3	1	2	13	47
8 657.3	1.201	$1,g$	0	0	0	5	−5	8	6	0	13	31
8 657.7	1.186	$0,u^-$	1	0	0	3	−3	5	3	1	13	52
8 659.1	1.187	$2,g$								1	13	<25
8 660.9	1.188	$0,u^+$	0	1	0	3	1	7	−1	1	13	35
8 660.9	1.157	$0,g^+$	2	1	0	0	0	0	0	3	13	89
8 661.6	1.170	$1,g$	1	0	1	0	0	3	1	2	13	75
8 662.0	1.177	$1,u$	0	2	0	2	2	5	−1	2	13	30
		$1,u$	0	2	0	2	−2	5	3	2	13	39
8 663.1	1.188	$2,u$								1	13	<25
8 668.1	1.188	$0,g^-$	0	0	1	3	−1	5	1	1	13	26
		$0,g^-$	0	1	0	4	−2	6	2	1	13	26
8 671.5	1.186	$2,u$	1	0	0	3	−3	5	5	1	13	37
8 673.7	1.185	$0,g^+$	1	0	0	4	2	4	−2	1	13	26
		$0,g^+$	1	0	0	4	0	4	0	1	13	34
8 676.4	1.188	$2,u$								1	13	<25
8 676.5	1.187	$2,g$								1	13	<25
8 676.5	1.200	$1,u$	0	0	0	4	0	9	1	0	13	26
8 677.7	1.200	$1,g$								0	13	<25
8 678.4	1.175	$1,u$	0	1	1	1	1	4	0	2	13	42
		$1,u$	0	1	1	1	−1	4	2	2	13	32
8 684.1	1.186	$2,g$								1	13	<25
8 688.4	1.187	$0,u^+$	1	0	0	3	3	5	−3	1	13	26
8 689.7	1.201	$1,u$								0	13	<25
8 696.8	1.169	$1,g$	2	0	0	1	1	2	0	2	13	30
		$1,g$	2	0	0	1	−1	2	2	2	13	45
8 698.0	1.187	$0,g^-$	0	0	1	3	−1	5	1	1	13	38
8 699.0	1.188	$0,u^-$	0	1	0	3	−3	7	3	1	13	44
8 699.4	1.200	$1,u$								0	13	<25
8 700.9	1.187	$2,u$	1	0	0	3	−3	5	5	1	13	26
8 702.0	1.175	$1,u$	0	1	1	1	1	4	0	2	13	37
		$1,u$	0	1	1	1	−1	4	2	2	13	41
8 702.3	1.201	$1,g$	0	0	0	5	−5	8	6	0	13	25
8 703.1	1.162	$0,g^+$	1	2	0	0	0	2	0	3	13	88
8 705.7	1.186	$0,u^+$	1	0	0	3	3	5	−3	1	13	29
		$0,u^+$	1	0	0	3	1	5	−1	1	13	38
8 707.6	1.169	$1,g$	2	0	0	1	1	2	0	2	13	50
		$1,g$	2	0	0	1	−1	2	2	2	13	38
8 709.0	1.187	$2,g$								1	13	<25
8 710.6	1.178	$1,u$	0	2	0	2	0	5	1	2	13	48

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8 712.5	1.188	2,u	0	0	1	2	2	6	0	1	13	26
		2,u	0	1	0	3	−3	7	5	1	13	25
8 716.8	1.162	2,g	1	2	0	0	0	2	2	3	13	92
8 718.2	1.186	2,u								1	13	<25
8 722.5	1.187	0,g^+	1	0	0	2	2	6	−2	1	13	31
		0,g^+	1	0	0	2	0	6	0	1	13	26
8 724.9	1.175	1,g	1	1	0	1	1	4	0	2	13	35
		1,g	1	1	0	1	−1	4	2	2	13	33
8 728.9	1.188	0,u^-	0	0	1	2	−2	6	2	1	13	50
		0,u^-	0	1	0	3	−3	7	3	1	13	28
8 737.8	1.187	2,g	1	0	0	2	0	6	2	1	13	25
8 741.8	1.188	2,u	0	0	1	2	−2	6	4	1	13	34
8 742.7	1.189	0,g^+								1	13	<25
8 743.3	1.167	0,g^+	0	3	0	0	0	4	0	3	13	90
8 747.4	1.201	1,u								0	13	<25
8 749.6	1.201	1,g								0	13	<25
8 752.1	1.189	2,g								1	13	<25
8 752.2	1.189	0,u^+	0	1	0	3	3	7	−3	1	13	33
8 756.2	1.167	2,g	0	3	0	0	0	4	2	3	13	93
8 757.5	1.185	0,u^-	1	0	0	3	−1	5	1	1	13	62
8 761.2	1.187	2,u								1	13	<25
8 762.7	1.201	1,u	0	0	0	4	4	9	−3	0	13	29
		1,u	0	0	0	4	−4	9	5	0	13	28
8 762.9	1.174	1,g	1	1	0	1	1	4	0	2	13	26
		1,g	1	1	0	1	−1	4	2	2	13	57
8 765.6	1.177	1,g	1	1	0	1	1	4	0	2	13	28
		1,g	0	2	0	1	1	6	0	2	13	26
		1,g	0	2	0	1	−1	6	2	2	13	39
8 766.0	1.200	1,g								0	13	<25
8 769.0	1.187	2,u	1	0	0	3	1	5	1	1	13	25
8 771.5	1.189	0,g^+	0	1	0	2	2	8	−2	1	13	35
8 779.0	1.186	0,g^-	1	0	0	2	−2	6	2	1	13	80
8 779.5	1.188	0,u^+	0	0	1	2	0	6	0	1	13	28
8 783.3	1.202	1,g	0	0	0	3	−1	10	2	0	13	27
8 785.8	1.189	2,g								1	13	<25
8 791.8	1.188	2,u	0	0	1	2	0	6	2	1	13	28
8 792.1	1.186	2,g	1	0	0	2	2	6	0	1	13	39
		2,g	1	0	0	2	−2	6	4	1	13	36
8 797.9	1.188	0,g^+	0	0	1	1	1	7	−1	1	13	65
8 803.7	1.176	1,g	0	1	1	0	0	5	1	2	13	84
8 812.2	1.202	1,u								0	13	<25
8 812.5	1.188	2,g	0	0	1	1	−1	7	3	1	13	40
8 814.9	1.179	1,g	0	2	0	1	1	6	0	2	13	42
		1,g	0	2	0	1	−1	6	2	2	13	47
8 815.3	1.170	1,u	2	0	0	0	0	3	1	2	13	87
8 824.5	1.201	1,g								0	13	<25
8 827.7	1.190	0,u^-	0	1	0	3	−1	7	1	1	13	45
8 830.1	1.189	0,g^-	0	1	0	2	−2	8	2	1	13	56
8 831.6	1.165	1,g	0	3	0	5	1	0	0	3	14	96
8 834.5	1.175	0,g^+	0	2	0	8	0	0	0	2	14	79
8 836.9	1.201	1,u								0	13	<25
8 837.9	1.190	2,u								1	13	<25
8 838.1	1.175	2,g	0	2	0	8	2	0	0	2	14	81
8 838.8	1.186	0,g^+	1	0	0	2	2	6	−2	1	13	33
		0,g^+	1	0	0	2	0	6	0	1	13	46
8 841.1	1.189	2,g								1	13	<25
8 843.3	1.187	0,u^+	1	0	0	1	1	7	−1	1	13	71
8 850.0	1.187	2,g	1	0	0	2	0	6	2	1	13	35
8 854.2	1.189	0,g^-	0	0	1	1	−1	7	1	1	13	60
		0,g^-	0	1	0	2	−2	8	2	1	13	27
8 857.8	1.187	2,u	1	0	0	1	1	7	1	1	13	35
		2,u	1	0	0	1	−1	7	3	1	13	36
8 860.5	1.174	0,u^+	0	1	1	6	0	0	0	2	14	31
		0,u^+	0	2	0	7	1	1	−1	2	14	50

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8 863.9	1.174	2,*u*	0	1	1	6	2	0	0	2	14	31
		2,*u*	0	2	0	7	3	1	−1	2	14	36
8 865.1	1.175	1,*u*	1	1	0	0	0	5	1	2	13	81
8 867.8	1.188	2,*g*	0	0	1	1	1	7	1	1	13	27
		2,*g*	0	0	1	1	−1	7	3	1	13	31
8 869.1	1.202	1,*g*	0	0	0	3	−3	10	4	0	13	28
8 886.3	1.203	1,*u*	0	0	0	2	2	11	−1	0	13	35
8 888.0	1.185	1,*u*	0	0	1	9	1	0	0	1	14	27
8 889.3	1.185	1,*g*								1	14	<25
8 890.7	1.203	1,*u*	0	0	0	2	−2	11	3	0	13	39
8 893.1	1.171	0,g^+	0	0	2	4	0	0	0	2	14	52
8 894.4	1.190	0,u^+	0	1	0	1	1	9	−1	1	13	64
8 896.9	1.171	2,*g*	0	0	2	4	2	0	0	2	14	53
8 905.5	1.173	0,u^+	0	1	1	6	0	0	0	2	14	34
		0,u^+	0	2	0	7	1	1	−1	2	14	38
8 907.2	1.191	0,g^+	0	1	0	2	2	8	−2	1	13	32
		0,g^+	0	1	0	2	0	8	0	1	13	33
8 907.4	1.201	1,*g*								0	13	<25
8 907.5	1.173	2,*u*	0	1	1	6	2	0	0	2	14	37
		2,*u*	0	2	0	7	3	1	−1	2	14	36
8 908.1	1.190	2,*u*	0	1	0	1	1	9	1	1	13	29
		2,*u*	0	1	0	1	−1	9	3	1	13	33
8 911.8	1.165	1,*u*	0	3	0	4	2	1	−1	3	14	57
		1,*u*	0	3	0	4	0	1	1	3	14	29
8 913.9	1.179	1,*u*	0	2	0	0	0	7	1	2	13	86
8 914.1	1.187	0,u^-	1	0	0	1	−1	7	1	1	13	86
8 915.3	1.189	0,u^+	0	0	1	0	0	8	0	1	13	73
8 917.5	1.176	0,u^-	0	2	0	7	−1	1	1	2	14	83
8 918.4	1.191	2,*g*	0	1	0	2	0	8	2	1	13	34
8 923.2	1.175	0,g^+	0	2	0	6	2	2	−2	2	14	32
8 923.5	1.176	2,*u*	0	2	0	7	1	1	1	2	14	65
8 924.0	1.188	2,*u*	1	0	0	1	−1	7	3	1	13	34
8 924.1	1.175	2,*g*	0	2	0	6	4	2	−2	2	14	36
8 930.3	1.185	1,*g*	0	1	0	11	1	0	0	1	14	44
8 931.6	1.188	2,*u*	0	0	1	0	0	8	2	1	13	48
8 936.1	1.155	0,g^+	0	4	0	2	0	0	0	4	14	100
8 938.3	1.185	1,*u*	0	0	1	9	1	0	0	1	14	51
8 938.6	1.171	0,u^+	1	0	1	4	0	0	0	2	14	34
		0,u^+	0	1	1	6	0	0	0	2	14	30
8 939.2	1.155	2,*g*	0	4	0	2	2	0	0	4	14	100
8 940.5	1.203	1,*g*	0	0	0	1	−1	12	2	0	13	26
8 942.2	1.171	2,*u*	1	0	1	4	2	0	0	2	14	40
		2,*u*	0	1	1	6	2	0	0	2	14	27
8 947.0	1.166	1,*u*	0	3	0	4	2	1	−1	3	14	36
		1,*u*	0	3	0	4	0	1	1	3	14	61
8 953.6	1.176	0,g^-	0	1	1	5	−1	1	1	2	14	27
		0,g^-	0	2	0	6	−2	2	2	2	14	60
8 955.3	1.186	1,*u*	0	1	0	10	2	1	−1	1	14	37
8 957.1	1.175	2,*g*	0	2	0	6	4	2	−2	2	14	27
8 957.2	1.186	1,*g*								1	14	<25
8 957.6	1.186	1,*u*								1	14	<25
8 962.5	1.173	0,g^+	1	1	0	6	0	0	0	2	14	52
8 962.6	1.186	1,*g*	0	0	1	8	2	1	−1	1	14	28
8 966.3	1.174	2,*g*	1	1	0	6	2	0	0	2	14	41
8 970.4	1.163	1,*u*	0	2	1	3	1	0	0	3	14	85
8 973.6	1.202	1,*u*								0	13	<25
8 975.7	1.188	0,g^+	1	0	0	0	0	8	0	1	13	85
8 977.2	1.174	0,u^+								2	14	<25
8 977.6	1.174	2,*u*								2	14	<25
8 978.8	1.191	0,u^-	0	1	0	1	−1	9	1	1	13	80
8 982.9	1.199	0,u^+	0	0	0	9	1	5	−1	0	14	34
		0,u^+	0	0	0	11	1	3	−1	0	14	33
8 982.9	1.199	0,g^+								0	14	<25
8 984.3	1.173	2,*g*	0	1	1	5	3	1	−1	2	14	44

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8 985.9	1.173	$0,g^+$	1	1	0	6	0	0	0	2	14	26
		$0,g^+$	0	1	1	5	1	1	−1	2	14	39
8 987.7	1.199	$2,u$								0	14	<25
8 987.7	1.199	$2,g$								0	14	<25
8 988.7	1.186	$1,g$								1	14	<25
8 989.3	1.186	$1,u$								1	14	<25
8 989.5	1.188	$2,g$	1	0	0	0	0	8	2	1	13	85
8 990.9	1.191	$2,u$	0	1	0	1	1	9	1	1	13	41
		$2,u$	0	1	0	1	−1	9	3	1	13	40
8 994.4	1.186	$1,u$								1	14	<25
8 996.0	1.173	$0,u^-$	0	0	2	3	−1	1	1	2	14	51
8 997.7	1.173	$2,u$	0	0	2	3	3	1	−1	2	14	52
8 998.7	1.174	$0,g^-$	0	1	1	5	−1	1	1	2	14	54
		$0,g^-$	0	2	0	6	−2	2	2	2	14	30
8 999.1	1.203	$1,u$	0	0	0	2	−2	11	3	0	13	28
9 001.9	1.173	$0,u^+$	0	0	2	3	1	1	−1	2	14	42
9 003.3	1.173	$2,u$	0	0	2	3	1	1	1	2	14	30
9 003.7	1.185	$1,g$								1	14	<25
9 004.9	1.174	$2,g$	0	1	1	5	1	1	1	2	14	43
9 006.8	1.165	$1,g$	0	3	0	3	3	2	−2	3	14	34
9 009.4	1.203	$1,g$	0	0	0	1	1	12	0	0	13	26
9 010.9	1.174	$0,g^+$	0	2	0	6	0	2	0	2	14	28
9 011.2	1.173	$0,g^+$	1	0	1	3	1	1	−1	2	14	31
9 014.7	1.184	$1,g$	1	0	0	9	1	0	0	1	14	48
9 016.6	1.171	$2,g$	1	0	1	3	3	1	−1	2	14	48
9 018.5	1.176	$2,g$	0	2	0	6	2	2	0	2	14	28
		$2,g$	0	2	0	6	0	2	2	2	14	43
9 019.7	1.175	$0,u^-$	0	0	2	3	−1	1	1	2	14	27
		$0,u^-$	0	2	0	5	−3	3	3	2	14	48
9 021.5	1.173	$2,u$	0	0	2	3	1	1	1	2	14	30
		$2,u$	1	1	0	5	3	1	−1	2	14	27
9 021.8	1.187	$1,g$								1	14	<25
9 026.1	1.174	$0,u^+$	1	1	0	5	1	1	−1	2	14	63
9 026.6	1.163	$1,g$	1	2	0	3	1	0	0	3	14	51
		$1,g$	0	3	0	3	3	2	−2	3	14	35
9 028.5	1.186	$1,u$	0	1	0	8	4	3	−3	1	14	26
9 029.9	1.175	$2,u$	1	1	0	5	3	1	−1	2	14	30
9 032.0	1.192	$0,g^+$	0	1	0	0	0	10	0	1	13	83
9 035.4	1.203	$1,g$	0	0	0	1	−1	12	2	0	13	27
9 035.7	1.200	$0,u^-$	0	0	0	9	−3	5	3	0	14	29
9 035.7	1.200	$0,g^-$	0	0	0	10	−2	4	2	0	14	37
9 035.8	1.166	$1,g$	0	3	0	3	−1	2	2	3	14	49
9 035.8	1.187	$1,g$								1	14	<25
9 036.3	1.186	$1,u$								1	14	<25
9 037.1	1.187	$1,g$								1	14	<25
9 037.1	1.199	$2,u$	0	0	0	9	5	5	−3	0	14	27
9 037.2	1.199	$2,g$								0	14	<25
9 040.6	1.185	$1,u$	1	0	0	8	2	1	−1	1	14	34
9 042.7	1.171	$0,g^-$	1	0	1	3	−1	1	1	2	14	60
9 042.8	1.187	$1,u$								1	14	<25
9 045.2	1.199	$0,u^+$	0	0	0	13	1	1	−1	0	14	32
9 045.3	1.192	$2,g$	0	1	0	0	0	10	2	1	13	83
9 045.3	1.199	$0,g^+$	0	0	0	12	0	2	0	0	14	31
9 047.6	1.171	$2,g$	1	0	1	3	3	1	−1	2	14	28
		$2,g$	1	0	1	3	1	1	1	2	14	39
9 047.9	1.161	$1,g$	0	1	2	1	1	0	0	3	14	69
9 050.4	1.199	$2,g$								0	14	<25
9 050.7	1.199	$2,u$								0	14	<25
9 052.8	1.177	$0,u^+$	0	2	0	5	3	3	−3	2	14	37
		$0,u^+$	0	2	0	5	1	3	−1	2	14	28
9 054.5	1.175	$2,u$	1	1	0	5	1	1	1	2	14	27
9 055.1	1.174	$0,u^-$	1	1	0	5	−1	1	1	2	14	62
9 056.7	1.175	$2,u$	0	1	1	4	4	2	−2	2	14	41
9 062.0	1.175	$0,g^+$								2	14	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 063.3	1.174	$0,u^+$	0	1	1	4	2	2	−2	2	14	35
9 064.2	1.187	$1,g$	0	1	0	7	5	4	−4	1	14	26
9 065.2	1.175	$2,u$	0	2	0	5	−1	3	3	2	14	28
9 067.4	1.187	$1,u$								1	14	<25
9 068.4	1.187	$1,g$								1	14	<25
9 069.3	1.167	$1,g$	0	3	0	3	1	2	0	3	14	55
		$1,g$	0	3	0	3	−1	2	2	3	14	33
9 070.4	1.185	$1,u$	1	0	0	8	0	1	1	1	14	37
9 074.1	1.198	$2,g$								0	14	<25
9 074.5	1.155	$0,u^+$	0	4	0	1	1	1	−1	4	14	97
9 076.2	1.204	$1,u$	0	0	0	0	0	13	1	0	13	63
9 076.3	1.199	$2,u$	0	0	0	9	7	5	−5	0	14	47
9 076.9	1.175	$2,g$								2	14	<25
9 077.7	1.185	$1,g$	1	0	0	7	3	2	−2	1	14	35
9 078.8	1.174	$0,u^-$	0	1	1	4	−2	2	2	2	14	54
9 080.3	1.198	$0,g^+$	0	0	0	12	2	2	−2	0	14	33
		$0,g^+$	0	0	0	14	0	0	0	0	14	27
9 080.3	1.175	$0,g^-$	0	2	0	4	−4	4	4	2	14	26
9 081.3	1.186	$1,u$								1	14	<25
9 081.3	1.199	$0,u^-$	0	0	0	11	−1	3	1	0	14	28
		$0,u^-$	0	0	0	13	−1	1	1	0	14	27
9 083.3	1.199	$0,g^-$	0	0	0	8	−4	6	4	0	14	27
		$0,g^-$	0	0	0	12	−2	2	2	0	14	34
9 083.9	1.175	$2,u$	0	1	1	4	2	2	0	2	14	36
9 084.2	1.163	$1,g$	0	2	1	2	2	1	−1	3	14	70
9 085.7	1.159	$1,u$	1	1	1	1	1	0	0	3	14	89
9 086.2	1.172	$0,g^+$	0	0	2	2	2	2	−2	2	14	35
9 086.5	1.199	$2,u$								0	14	<25
9 086.7	1.199	$0,u^+$	0	0	0	11	3	3	−3	0	14	46
9 088.4	1.156	$0,u^-$	0	4	0	1	−1	1	1	4	14	100
9 090.0	1.187	$1,u$								1	14	<25
9 093.8	1.199	$2,g$	0	0	0	12	0	2	2	0	14	29
9 094.2	1.171	$2,g$	2	0	0	4	2	0	0	2	14	39
9 095.2	1.164	$1,g$	0	2	1	2	0	1	1	3	14	76
9 096.2	1.156	$2,u$	0	4	0	1	1	1	1	4	14	100
9 097.8	1.175	$0,u^+$	0	1	1	4	2	2	−2	2	14	25
		$0,u^+$	0	1	1	4	0	2	0	2	14	36
9 099.8	1.200	$2,g$	0	0	0	8	8	6	−6	0	14	69
9 099.8	1.173	$0,g^+$								2	14	<25
9 100.9	1.174	$0,g^-$	0	0	2	2	−2	2	2	2	14	51
		$0,g^-$	0	2	0	4	−4	4	4	2	14	26
9 101.4	1.200	$0,g^+$	0	0	0	10	4	4	−4	0	14	34
9 102.0	1.172	$0,g^+$	2	0	0	4	0	0	0	2	14	37
9 102.7	1.173	$2,g$	2	0	0	4	2	0	0	2	14	25
		$2,g$	1	1	0	4	4	2	−2	2	14	38
9 102.7	1.188	$1,u$								1	14	<25
9 103.4	1.200	$0,u^+$								0	14	<25
9 103.7	1.186	$1,g$	1	0	0	7	−1	2	2	1	14	34
9 104.4	1.172	$0,u^+$	1	0	1	2	2	2	−2	2	14	41
9 105.4	1.199	$0,u^-$	0	0	0	9	−5	5	5	0	14	30
		$0,u^-$	0	0	0	11	−3	3	3	0	14	36
9 105.9	1.175	$2,u$	0	1	1	4	0	2	2	2	14	40
9 106.8	1.173	$0,g^+$	1	1	0	4	2	2	−2	2	14	30
9 107.5	1.200	$2,u$								0	14	<25
9 108.8	1.187	$1,g$								1	14	<25
9 109.1	1.173	$2,g$	0	0	2	2	2	2	0	2	14	45
9 110.2	1.178	$0,u^-$	0	2	0	5	−1	3	1	2	14	67
9 111.8	1.200	$2,g$								0	14	<25
9 112.8	1.175	$2,g$	0	2	0	4	4	4	−2	2	14	28
9 114.3	1.188	$1,u$								1	14	<25
9 115.0	1.187	$1,g$								1	14	<25
9 115.8	1.200	$0,g^+$	0	0	0	8	6	6	−6	0	14	25
9 116.9	1.188	$1,u$								1	14	<25
9 118.7	1.177	$2,u$	0	2	0	5	1	3	1	2	14	39

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		2,*u*	0	2	0	5	−1	3	3	2	14	27
9 119.2	1.199	2,*u*								0	14	<25
9 120.8	1.187	1,*g*								1	14	<25
9 121.2	1.172	2,*u*	1	0	1	2	2	2	0	2	14	42
9 121.4	1.176	$0,g^+$	0	2	0	4	4	4	−4	2	14	28
9 122.3	1.174	$0,g^-$	1	1	0	4	−2	2	2	2	14	72
9 124.8	1.186	1,*u*	1	0	0	6	4	3	−3	1	14	30
9 125.2	1.173	2,*g*	0	0	2	2	0	2	2	2	14	37
9 125.9	1.171	$0,u^-$	1	0	1	2	−2	2	2	2	14	84
9 127.8	1.164	1,*u*	1	2	0	2	2	1	−1	3	14	30
9 129.7	1.201	$0,g^-$	0	0	0	8	−6	6	6	0	14	49
		$0,g^-$	0	0	0	10	−4	4	4	0	14	27
9 134.7	1.176	2,*g*								2	14	<25
9 138.0	1.200	2,*g*								0	14	<25
9 143.0	1.200	$0,u^+$	0	0	0	9	5	5	−5	0	14	26
9 143.2	1.185	1,*g*	1	0	0	7	1	2	0	1	14	25
9 143.6	1.187	1,*g*								1	14	<25
9 144.0	1.164	1,*u*	1	2	0	2	2	1	−1	3	14	53
9 144.7	1.188	1,*u*								1	14	<25
9 145.5	1.203	1,*g*								0	13	<25
9 146.6	1.199	$0,g^+$	0	0	0	14	0	0	0	0	14	32
9 147.9	1.187	1,*u*								1	14	<25
9 148.6	1.175	$0,g^+$	0	1	1	3	3	3	−3	2	14	33
		$0,g^+$	0	1	1	3	1	3	−1	2	14	30
9 149.7	1.204	1,*u*	0	0	0	0	0	13	1	0	13	25
9 150.3	1.200	2,*u*								0	14	<25
9 151.3	1.152	$0,u^+$	0	3	1	0	0	0	0	4	14	97
9 151.7	1.172	$0,u^+$	1	0	1	2	2	2	−2	2	14	49
		$0,u^+$	1	0	1	2	0	2	0	2	14	35
9 152.4	1.187	1,*u*	0	1	0	6	−4	5	5	1	14	25
9 152.9	1.199	2,*g*	0	0	0	14	2	0	0	0	14	33
9 154.4	1.164	1,*u*	1	2	0	2	0	1	1	3	14	62
9 154.5	1.171	2,*u*	1	0	1	2	2	2	0	2	14	27
		2,*u*	1	0	1	2	0	2	2	2	14	41
9 154.5	1.174	$0,g^+$	1	1	0	4	2	2	−2	2	14	28
		$0,g^+$	1	1	0	4	0	2	0	2	14	40
9 154.8	1.177	$0,g^-$	0	2	0	4	−2	4	2	2	14	57
9 157.2	1.175	2,*g*	1	1	0	4	0	2	2	2	14	31
9 158.0	1.201	$0,u^+$	0	0	0	7	7	7	−7	0	14	34
9 158.4	1.176	$0,g^-$	0	1	1	3	−3	3	3	2	14	41
9 161.1	1.187	1,*g*								1	14	<25
9 161.4	1.187	1,*g*								1	14	<25
9 162.5	1.176	2,*g*	0	1	1	3	3	3	−1	2	14	48
9 163.0	1.166	1,*u*	0	3	0	2	2	3	−1	3	14	31
		1,*u*	0	3	0	2	−2	3	3	3	14	46
9 165.8	1.201	$0,u^-$	0	0	0	7	−7	7	7	0	14	38
		$0,u^-$	0	0	0	9	−5	5	5	0	14	26
9 166.0	1.176	$0,u^+$								2	14	<25
9 166.4	1.200	$0,g^+$								0	14	<25
9 168.6	1.176	2,*g*	0	2	0	4	−2	4	4	2	14	28
9 170.2	1.201	$0,g^-$								0	14	<25
9 170.3	1.188	1,*g*								1	14	<25
9 170.8	1.201	2,*u*								0	14	<25
9 170.8	1.200	2,*g*								0	14	<25
9 171.9	1.201	$0,u^-$	0	0	0	7	−7	7	7	0	14	29
9 175.5	1.170	2,*u*	2	0	0	3	3	1	−1	2	14	67
9 176.3	1.170	$0,u^+$	2	0	0	3	1	1	−1	2	14	69
9 176.8	1.175	$0,g^+$	0	1	1	3	3	3	−3	2	14	30
		$0,g^+$	0	1	1	3	1	3	−1	2	14	30
9 178.4	1.161	1,*u*	0	1	2	0	0	1	1	3	14	75
9 178.9	1.186	1,*u*	1	0	0	6	−2	3	3	1	14	26
9 179.4	1.200	2,*u*								0	14	<25
9 179.7	1.200	2,*g*								0	14	<25
9 183.0	1.176	2,*u*								2	14	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 186.2	1.175	2,*g*	0	1	1	3	−1	3	3	2	14	28
9 187.8	1.188	1,*g*								1	14	<25
9 189.6	1.201	0,u^+	0	0	0	7	7	7	−7	0	14	50
9 189.7	1.188	1,*u*								1	14	<25
9 192.7	1.175	0,u^-	1	1	0	3	−3	3	3	2	14	50
9 195.3	1.188	1,*g*								1	14	<25
9 195.7	1.167	1,*u*	0	3	0	2	2	3	−1	3	14	25
		1,*u*	0	3	0	2	0	3	1	3	14	58
9 197.4	1.170	0,u^-	2	0	0	3	−1	1	1	2	14	83
9 198.1	1.201	2,*u*	0	0	0	7	7	7	−5	0	14	26
9 198.4	1.173	0,u^+	0	0	2	1	1	3	−1	2	14	32
		0,u^+	1	1	0	3	3	3	−3	2	14	26
9 199.9	1.176	0,g^-	0	1	1	3	−1	3	1	2	14	62
9 200.0	1.188	1,*u*								1	14	<25
9 200.9	1.171	2,*u*	2	0	0	3	1	1	1	2	14	47
9 201.8	1.189	1,*g*								1	14	<25
9 204.6	1.200	0,u^-	0	0	0	13	−1	1	1	0	14	35
9 204.6	1.176	0,u^+	0	2	0	3	1	5	−1	2	14	27
9 205.4	1.187	1,*g*								1	14	<25
9 206.9	1.188	1,*u*								1	14	<25
9 208.0	1.200	0,g^-	0	0	0	6	−4	8	4	0	14	26
9 209.3	1.176	2,*g*	0	1	1	3	1	3	1	2	14	31
		2,*g*	0	1	1	3	−1	3	3	2	14	28
9 210.7	1.174	2,*u*	1	1	0	3	3	3	−1	2	14	27
9 211.4	1.200	2,*u*								0	14	<25
9 212.4	1.179	0,g^+	0	2	0	4	2	4	−2	2	14	37
		0,g^+	0	2	0	4	0	4	0	2	14	40
9 212.6	1.174	0,u^-	0	0	2	1	−1	3	1	2	14	52
9 212.7	1.201	2,*g*								0	14	<25
9 214.0	1.164	1,*u*	0	2	1	1	1	2	0	3	14	53
9 214.9	1.151	0,g^+	1	3	0	0	0	0	0	4	14	95
9 215.8	1.202	0,g^+								0	14	<25
9 216.5	1.160	1,*g*	1	1	1	0	0	1	1	3	14	76
9 219.0	1.172	0,g^+	1	0	1	1	1	3	−1	2	14	68
9 219.2	1.173	2,*u*	0	0	2	1	1	3	1	2	14	40
9 221.4	1.175	0,u^+	1	1	0	3	3	3	−3	2	14	40
		0,u^+	1	1	0	3	1	3	−1	2	14	38
9 222.1	1.186	1,*u*	1	0	0	6	0	3	1	1	14	27
9 222.1	1.178	2,*g*	0	2	0	4	0	4	2	2	14	40
9 222.2	1.176	2,*u*								2	14	<25
9 222.2	1.187	1,*g*								1	14	<25
9 223.0	1.164	1,*u*	0	2	1	1	1	2	0	3	14	32
		1,*u*	0	2	1	1	−1	2	2	3	14	57
9 224.8	1.177	0,u^-	0	2	0	3	−3	5	3	2	14	46
9 227.7	1.188	1,*g*								1	14	<25
9 227.9	1.201	0,u^-								0	14	<25
9 230.2	1.174	2,*u*	0	0	2	1	−1	3	3	2	14	32
9 233.9	1.202	2,*g*								0	14	<25
9 234.0	1.201	2,*u*								0	14	<25
9 235.1	1.172	2,*g*	1	0	1	1	1	3	1	2	14	40
		2,*g*	1	0	1	1	−1	3	3	2	14	29
9 236.3	1.189	1,*g*								1	14	<25
9 239.2	1.159	1,*g*	2	1	0	1	1	0	0	3	14	76
9 239.4	1.187	1,*u*								1	14	<25
9 240.1	1.177	2,*u*	0	2	0	3	−3	5	5	2	14	35
9 240.9	1.201	0,u^+								0	14	<25
9 241.6	1.201	0,g^+								0	14	<25
9 244.3	1.188	1,*u*								1	14	<25
9 246.2	1.156	0,g^+	0	4	0	0	0	2	0	4	14	95
9 249.1	1.201	2,*g*								0	14	<25
9 249.1	1.189	1,*u*								1	14	<25
9 250.4	1.201	2,*u*								0	14	<25
9 251.8	1.202	0,g^-	0	0	0	6	−6	8	6	0	14	52
9 253.3	1.172	0,g^-	1	0	1	1	−1	3	1	2	14	74

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 253.5	1.176	$0,u^+$	0	1	1	2	2	4	−2	2	14	49
9 256.1	1.187	$1,g$								1	14	<25
9 256.9	1.175	$0,u^-$	1	1	0	3	−1	3	1	2	14	64
9 258.5	1.156	$2,g$	0	4	0	0	0	2	2	4	14	100
9 259.0	1.178	$0,u^+$	0	2	0	3	3	5	−3	2	14	49
9 261.8	1.176	$2,u$	1	1	0	3	−1	3	3	2	14	28
9 262.1	1.164	$1,g$	1	2	0	1	1	2	0	3	14	37
		$1,g$	1	2	0	1	−1	2	2	3	14	31
9 265.6	1.202	$2,g$	0	0	0	6	−6	8	8	0	14	36
9 265.9	1.172	$2,g$	1	0	1	1	1	3	1	2	14	27
		$2,g$	1	0	1	1	−1	3	3	2	14	55
9 269.0	1.177	$2,u$	0	1	1	2	2	4	0	2	14	33
9 270.2	1.171	$0,g^+$	2	0	0	2	2	2	−2	2	14	58
9 270.6	1.202	$0,u^+$								0	14	<25
9 270.9	1.188	$1,u$	1	0	0	4	−4	5	5	1	14	39
9 270.9	1.200	$0,g^+$								0	14	<25
9 272.7	1.189	$1,g$								1	14	<25
9 273.1	1.177	$2,u$	1	1	0	3	1	3	1	2	14	29
9 275.5	1.176	$0,u^-$	0	1	1	2	−2	4	2	2	14	66
9 277.2	1.189	$1,u$	1	0	0	4	4	5	−3	1	14	25
9 278.6	1.200	$2,g$								0	14	<25
9 280.6	1.171	$0,g^-$	2	0	0	2	−2	2	2	2	14	75
9 280.8	1.201	$2,u$								0	14	<25
9 282.3	1.163	$1,g$	1	2	0	1	1	2	0	3	14	38
		$1,g$	1	2	0	1	−1	2	2	3	14	54
9 282.9	1.177	$0,g^+$	1	1	0	2	2	4	−2	2	14	26
9 287.7	1.189	$1,u$								1	14	<25
9 288.9	1.202	$0,g^+$	0	0	0	6	6	8	−6	0	14	45
9 289.1	1.176	$2,u$	0	1	1	2	2	4	0	2	14	30
		$2,u$	0	1	1	2	−2	4	4	2	14	38
9 289.3	1.171	$2,g$	2	0	0	2	2	2	0	2	14	53
9 289.8	1.202	$0,u^+$	0	0	0	5	5	9	−5	0	14	31
9 291.4	1.188	$1,u$								1	14	<25
9 291.7	1.189	$1,g$								1	14	<25
9 292.2	1.167	$1,g$	0	3	0	1	1	4	0	3	14	32
		$1,g$	0	3	0	1	−1	4	2	3	14	41
9 297.8	1.202	$2,g$								0	14	<25
9 298.4	1.188	$1,g$								1	14	<25
9 298.8	1.177	$2,g$								2	14	<25
9 300.0	1.170	$0,g^+$	2	0	0	2	2	2	−2	2	14	26
		$0,g^+$	2	0	0	2	0	2	0	2	14	60
9 304.1	1.203	$2,u$								0	14	<25
9 302.0	1.177	$0,u^+$	0	1	1	2	2	4	−2	2	14	31
		$0,u^+$	0	1	1	2	0	4	0	2	14	44
9 304.0	1.186	$1,g$								1	14	<25
9 308.1	1.189	$1,u$								1	14	<25
9 311.9	1.170	$2,g$	2	0	0	2	0	2	2	2	14	61
9 312.0	1.202	$0,u^-$								0	14	<25
9 312.6	1.202	$0,g^-$								0	14	<25
9 312.8	1.177	$2,u$	0	1	1	2	0	4	2	2	14	40
9 315.3	1.179	$0,u^-$	0	2	0	3	−1	5	1	2	14	69
9 317.4	1.174	$0,g^+$	0	0	2	0	0	4	0	2	14	53
9 318.5	1.189	$1,u$								1	14	<25
9 319.9	1.176	$0,g^-$	1	1	0	2	−2	4	2	2	14	78
9 322.7	1.202	$2,g$								0	14	<25
9 322.9	1.202	$2,u$								0	14	<25
9 324.1	1.168	$1,g$	0	3	0	1	1	4	0	3	14	51
		$1,g$	0	3	0	1	−1	4	2	3	14	42
9 324.3	1.177	$0,g^+$	0	2	0	2	2	6	−2	2	14	28
9 326.2	1.179	$2,u$	0	2	0	3	1	5	1	2	14	33
		$2,u$	0	2	0	3	−1	5	3	2	14	33
9 327.5	1.189	$1,g$								1	14	<25
9 331.9	1.174	$2,g$	0	0	2	0	0	4	2	2	14	55
9 332.3	1.187	$1,u$	1	0	0	4	−2	5	3	1	14	26

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 333.3	1.176	2,*g*	1	1	0	2	−2	4	4	2	14	56
9 337.8	1.201	0,u^-								0	14	<25
9 339.2	1.177	2,*g*								2	14	<25
9 341.2	1.202	0,g^-								0	14	<25
9 347.1	1.201	2,*u*								0	14	<25
9 348.0	1.190	1,*g*								1	14	<25
9 348.4	1.202	2,*g*								0	14	<25
9 349.1	1.202	0,u^-	0	0	0	5	−5	9	5	0	14	44
9 349.4	1.173	0,u^+	1	0	1	0	0	4	0	2	14	68
9 350.0	1.188	1,*g*	1	0	0	3	3	6	−2	1	14	29
9 350.2	1.165	1,*g*	0	2	1	0	0	3	1	3	14	91
9 353.1	1.189	1,*u*								1	14	<25
9 358.2	1.202	2,*u*	0	0	0	5	−5	9	7	0	14	27
9 359.6	1.176	0,g^+	1	1	0	2	2	4	−2	2	14	37
		0,g^+	1	1	0	2	0	4	0	2	14	38
9 359.8	1.179	0,g^-	0	2	0	2	−2	6	2	2	14	72
9 361.8	1.204	0,g^+	0	0	0	4	2	10	−2	0	14	25
9 364.0	1.173	2,*u*	1	0	1	0	0	4	2	2	14	70
9 367.0	1.177	2,*g*	1	1	0	2	0	4	2	2	14	25
9 367.9	1.159	1,*u*	2	1	0	0	0	1	1	3	14	87
9 370.3	1.177	0,g^+	0	1	1	1	1	5	−1	2	14	66
9 374.9	1.178	2,*g*	0	2	0	2	−2	6	4	2	14	30
9 374.9	1.190	1,*g*								1	14	<25
9 376.4	1.190	1,*u*								1	14	<25
9 377.5	1.189	1,*g*								1	14	<25
9 377.7	1.204	2,*g*								0	14	<25
9 378.6	1.203	0,u^+	0	0	0	3	1	11	−1	0	14	26
9 384.9	1.177	2,*g*	0	1	1	1	1	5	1	2	14	45
		2,*g*	0	1	1	1	−1	5	3	2	14	26
9 385.9	1.187	1,*u*	1	0	0	4	0	5	1	1	14	26
9 387.0	1.172	0,u^+	2	0	0	1	1	3	−1	2	14	68
		0,u^+	1	0	1	0	0	4	0	2	14	26
9 388.3	1.202	0,g^+	0	0	0	4	4	10	−4	0	14	31
9 391.0	1.203	2,*u*								0	14	<25
9 395.4	1.190	1,*g*								1	14	<25
9 397.4	1.203	2,*g*								0	14	<25
9 401.5	1.171	2,*u*	2	0	0	1	−1	3	3	2	14	48
9 401.5	1.178	0,g^-	0	1	1	1	−1	5	1	2	14	81
9 403.3	1.171	0,u^-	2	0	0	1	−1	3	1	2	14	87
9 403.5	1.202	0,u^+								0	14	<25
9 405.3	1.188	1,*g*								1	14	<25
9 406.8	1.189	1,*u*								1	14	<25
9 408.8	1.189	1,*u*								1	14	<25
9 410.2	1.165	1,*u*	1	2	0	0	0	3	1	3	14	82
9 411.8	1.202	2,*u*								0	14	<25
9 412.3	1.177	0,u^+	1	1	0	1	1	5	−1	2	14	62
9 413.6	1.178	2,*g*	0	1	1	1	1	5	1	2	14	34
		2,*g*	0	1	1	1	−1	5	3	2	14	40
9 413.9	1.201	0,g^+								0	14	<25
9 416.1	1.171	2,*u*	2	0	0	1	1	3	1	2	14	51
		2,*u*	2	0	0	1	−1	3	3	2	14	35
9 416.7	1.180	0,g^+	0	2	0	2	2	6	−2	2	14	39
		0,g^+	0	2	0	2	0	6	0	2	14	47
9 420.7	1.201	2,*g*								0	14	<25
9 426.7	1.190	1,*g*	0	0	1	2	−2	7	3	1	14	30
9 427.0	1.177	2,*u*	1	1	0	1	1	5	1	2	14	32
		2,*u*	1	1	0	1	−1	5	3	2	14	31
9 428.6	1.180	2,*g*	0	2	0	2	0	6	2	2	14	45
9 439.6	1.204	0,g^-	0	0	0	4	−2	10	2	0	14	31
9 445.6	1.166	0,g^+	0	3	0	6	0	0	0	3	15	93
9 448.9	1.166	2,*g*	0	3	0	6	2	0	0	3	15	94
9 450.1	1.203	0,u^-	0	0	0	3	−3	11	3	0	14	25
9 452.4	1.169	1,*u*	0	3	0	0	0	5	1	3	14	87
9 452.7	1.204	2,*g*								0	14	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 455.4	1.191	1,*g*								1	14	<25
9 455.9	1.180	0,u^+	1	1	0	1	1	5	−1	2	14	26
		0,u^+	0	2	0	1	1	7	−1	2	14	67
9 456.9	1.191	1,*u*	0	1	0	2	0	9	1	1	14	40
9 458.9	1.203	2,*u*								0	14	<25
9 459.3	1.204	0,u^+	0	0	0	3	1	11	−1	0	14	37
9 460.6	1.176	0,u^-	1	1	0	1	−1	5	1	2	14	87
9 460.8	1.191	1,*u*								1	14	<25
9 466.2	1.188	1,*g*	1	0	0	3	1	6	0	1	14	27
9 467.8	1.203	0,g^-	0	0	0	4	−4	10	4	0	14	35
9 469.1	1.179	2,*u*	1	1	0	1	−1	5	3	2	14	36
		2,*u*	0	2	0	1	1	7	1	2	14	32
9 472.5	1.176	1,*g*	0	2	0	9	1	0	0	2	15	60
9 473.4	1.177	2,*u*	1	1	0	1	1	5	1	2	14	53
9 474.1	1.188	1,*u*	1	0	0	2	2	7	−1	1	14	34
		1,*u*	1	0	0	2	−2	7	3	1	14	41
9 475.2	1.204	2,*u*	0	0	0	3	−1	11	3	0	14	26
9 476.1	1.203	2,*g*								0	14	<25
9 483.6	1.175	1,*u*	0	1	1	7	1	0	0	2	15	30
9 484.1	1.202	0,u^-								0	14	<25
9 484.9	1.190	1,*g*								1	14	<25
9 485.4	1.190	1,*u*	0	0	1	1	1	8	0	1	14	27
		1,*u*	0	0	1	1	−1	8	2	1	14	36
9 491.6	1.202	2,*u*								0	14	<25
9 494.7	1.178	0,u^+	0	1	1	0	0	6	0	2	14	85
9 501.2	1.204	0,g^+	0	0	0	2	0	12	0	0	14	28
9 503.2	1.172	0,g^+	2	0	0	0	0	4	0	2	14	84
9 507.1	1.173	1,*g*	0	0	2	5	1	0	0	2	15	46
9 508.2	1.178	2,*u*	0	1	1	0	0	6	2	2	14	82
9 510.8	1.166	0,u^+	0	3	0	5	1	1	−1	3	15	80
9 513.0	1.167	2,*u*	0	3	0	5	3	1	−1	3	15	62
9 514.2	1.181	0,u^-	0	2	0	1	−1	7	1	2	14	88
9 514.4	1.204	2,*g*								0	14	<25
9 515.6	1.156	1,*g*	0	4	0	3	1	0	0	4	15	99
9 517.4	1.172	2,*g*	2	0	0	0	0	4	2	2	14	85
9 522.1	1.186	0,u^+								1	15	<25
9 522.4	1.187	0,g^+	0	0	1	9	1	1	−1	1	15	26
9 526.7	1.186	2,*u*								1	15	<25
9 526.8	1.181	2,*u*	0	2	0	1	1	7	1	2	14	41
		2,*u*	0	2	0	1	−1	7	3	2	14	45
9 527.0	1.186	2,*g*								1	15	<25
9 527.3	1.191	1,*u*	0	1	0	2	−2	9	3	1	14	27
9 528.3	1.190	1,*g*	1	0	0	1	1	8	0	1	14	35
		1,*g*	1	0	0	1	−1	8	2	1	14	33
9 528.5	1.174	1,*u*	1	0	1	5	1	0	0	2	15	33
		1,*u*	0	2	0	8	2	1	−1	2	15	27
9 529.3	1.203	0,u^+	0	0	0	3	3	11	−3	0	14	36
9 538.6	1.203	2,*u*								0	14	<25
9 539.7	1.192	1,*g*								1	14	<25
9 540.3	1.176	1,*g*								2	15	<25
9 542.0	1.188	1,*u*	1	0	0	2	0	7	1	1	14	36
9 550.2	1.177	1,*u*	0	2	0	8	2	1	−1	2	15	28
		1,*u*	0	2	0	8	0	1	1	2	15	40
9 551.6	1.167	0,u^-	0	3	0	5	−1	1	1	3	15	94
9 552.9	1.203	0,g^+								0	14	<25
9 553.0	1.191	1,*u*	0	0	1	1	1	8	0	1	14	25
		1,*u*	0	0	1	1	−1	8	2	1	14	28
9 553.7	1.177	0,g^+	1	1	0	0	0	6	0	2	14	76
9 555.1	1.174	1,*u*	0	1	1	7	1	0	0	2	15	47
9 556.5	1.167	2,*u*	0	3	0	5	3	1	−1	3	15	30
		2,*u*	0	3	0	5	1	1	1	3	15	62
9 560.7	1.203	2,*g*								0	14	<25
9 561.6	1.204	0,u^-	0	0	0	3	−3	11	3	0	14	36
9 567.5	1.177	2,*g*	1	1	0	0	0	6	2	2	14	78

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 570.3	1.164	$0,u^+$	0	2	1	4	0	0	0	3	15	79
9 570.9	1.205	$0,g^+$								0	14	<25
9 572.5	1.177	$1,g$								2	15	<25
9 573.6	1.204	$2,u$	0	0	0	3	−3	11	5	0	14	28
9 573.8	1.164	$2,u$	0	2	1	4	2	0	0	3	15	78
9 575.9	1.186	$0,u^+$	0	0	1	10	0	0	0	1	15	43
9 577.6	1.186	$2,u$	0	0	1	10	2	0	0	1	15	39
9 577.9	1.186	$0,g^+$	1	0	0	10	0	0	0	1	15	28
		$0,g^+$	0	1	0	12	0	0	0	1	15	30
9 579.8	1.186	$2,g$	1	0	0	10	2	0	0	1	15	25
		$2,g$	0	1	0	12	2	0	0	1	15	27
9 581.2	1.192	$1,g$	0	1	0	1	1	10	0	1	14	28
		$1,g$	0	1	0	1	−1	10	2	1	14	32
9 581.7	1.205	$2,g$								0	14	<25
9 585.5	1.175	$1,u$	1	0	1	5	1	0	0	2	15	25
9 588.8	1.175	$1,g$	1	1	0	7	1	0	0	2	15	27
9 588.8	1.204	$0,g^-$	0	0	0	2	−2	12	2	0	14	50
9 589.2	1.187	$0,g^-$								1	15	<25
9 590.1	1.187	$0,u^-$								1	15	<25
9 591.1	1.166	$0,g^+$	0	3	0	4	2	2	−2	3	15	33
9 593.3	1.167	$2,g$	0	3	0	4	4	2	−2	3	15	47
9 596.0	1.187	$2,g$								1	15	<25
9 596.6	1.187	$2,u$								1	15	<25
9 601.2	1.204	$2,g$	0	0	0	2	−2	12	4	0	14	36
9 601.9	1.191	$1,g$	0	0	1	0	0	9	1	1	14	66
9 602.8	1.187	$0,g^+$	0	0	1	9	1	1	−1	1	15	46
9 602.9	1.174	$1,u$	0	0	2	4	2	1	−1	2	15	28
9 603.0	1.173	$1,g$	1	1	0	7	1	0	0	2	15	26
9 603.0	1.187	$0,u^+$	0	1	0	11	1	1	−1	1	15	43
9 604.5	1.181	$0,g^+$	0	2	0	0	0	8	0	2	14	83
9 604.6	1.187	$2,u$	0	1	0	11	3	1	−1	1	15	31
9 605.0	1.187	$2,g$	0	0	1	9	3	1	−1	1	15	33
9 610.4	1.174	$1,u$								2	15	<25
9 611.5	1.189	$1,g$	1	0	0	1	1	8	0	1	14	42
		$1,g$	1	0	0	1	−1	8	2	1	14	34
9 612.8	1.193	$1,u$								1	14	<25
9 615.2	1.175	$1,g$	0	1	1	6	2	1	−1	2	15	37
9 617.7	1.181	$2,g$	0	2	0	0	0	8	2	2	14	84
9 618.0	1.188	$2,g$								1	15	<25
9 618.3	1.188	$0,g^+$	0	1	0	10	2	2	−2	1	15	30
9 618.3	1.164	$0,g^+$	0	1	2	2	0	0	0	3	15	27
		$0,g^+$	1	2	0	4	0	0	0	3	15	29
9 618.6	1.164	$2,g$	1	2	0	4	2	0	0	3	15	34
		$2,g$	0	3	0	4	4	2	−2	3	15	31
9 619.3	1.201	$1,u$								0	15	<25
9 619.3	1.201	$1,g$								0	15	<25
9 619.8	1.204	$0,u^-$								0	14	<25
9 620.6	1.175	$1,g$	0	1	1	6	0	1	1	2	15	34
9 624.4	1.168	$0,g^-$	0	3	0	4	−2	2	2	3	15	85
9 626.5	1.205	$0,u^+$	0	0	0	1	1	13	−1	0	14	64
9 627.2	1.204	$2,u$	0	0	0	1	1	13	1	0	14	26
9 627.6	1.188	$2,u$								1	15	<25
9 627.9	1.187	$0,u^+$								1	15	<25
9 629.5	1.188	$0,u^-$	0	1	0	11	−1	1	1	1	15	36
9 631.2	1.176	$1,u$								2	15	<25
9 631.7	1.166	$2,g$	0	3	0	4	2	2	0	3	15	29
		$2,g$	0	3	0	4	0	2	2	3	15	35
9 635.8	1.187	$2,u$	0	1	0	11	1	1	1	1	15	29
9 636.8	1.157	$1,u$	0	4	0	2	2	1	−1	4	15	72
9 637.8	1.162	$0,g^+$	0	1	2	2	0	0	0	3	15	39
		$0,g^+$	1	2	0	4	0	0	0	3	15	50
9 638.9	1.178	$1,g$	0	2	0	7	1	2	0	2	15	36
9 639.2	1.187	$0,g^-$	0	0	1	9	−1	1	1	1	15	41
9 640.2	1.159	$0,u^+$	2	0	1	0	0	0	0	3	15	28

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,u^+$	0	0	3	0	0	0	0	3	15	62
9 640.5	1.205	$2,u$	0	0	0	1	−1	13	3	0	14	43
9 640.8	1.163	$2,g$	0	1	2	2	2	0	0	3	15	41
		$2,g$	1	2	0	4	2	0	0	3	15	49
9 641.5	1.175	$1,u$	1	1	0	6	2	1	−1	2	15	36
9 643.2	1.187	$2,g$	0	0	1	9	1	1	1	1	15	33
9 649.1	1.174	$1,g$								2	15	<25
9 655.4	1.188	$0,g^-$	0	1	0	10	−2	2	2	1	15	44
9 656.2	1.188	$0,u^+$								1	15	<25
9 656.4	1.176	$1,g$								2	15	<25
9 656.6	1.189	$2,u$	0	0	1	6	6	4	−4	1	15	27
9 657.1	1.188	$2,g$								1	15	<25
9 659.3	1.157	$1,u$	0	4	0	2	2	1	−1	4	15	25
		$1,u$	0	4	0	2	0	1	1	4	15	74
9 661.8	1.190	$1,u$	1	0	0	0	0	9	1	1	14	80
9 662.0	1.188	$0,g^+$								1	15	<25
9 662.1	1.188	$2,g$								1	15	<25
9 662.4	1.158	$0,g^+$	1	0	2	0	0	0	0	3	15	82
9 663.6	1.188	$0,u^-$	0	0	1	8	−2	2	2	1	15	35
9 665.2	1.188	$0,g^+$								1	15	<25
9 665.3	1.188	$2,u$								1	15	<25
9 665.9	1.168	$0,g^+$	0	3	0	4	2	2	−2	3	15	38
		$0,g^+$	0	3	0	4	0	2	0	3	15	55
9 666.5	1.188	$0,u^+$								1	15	<25
9 667.1	1.178	$1,u$								2	15	<25
9 667.8	1.161	$0,u^+$	1	1	1	2	0	0	0	3	15	68
9 669.1	1.161	$2,u$	1	1	1	2	2	0	0	3	15	83
9 671.1	1.187	$2,g$								1	15	<25
9 672.1	1.167	$2,g$	0	3	0	4	2	2	0	3	15	33
		$2,g$	0	3	0	4	0	2	2	3	15	36
9 672.8	1.202	$1,g$								0	15	<25
9 672.8	1.202	$1,u$								0	15	<25
9 673.5	1.176	$1,u$	0	1	1	5	3	2	−2	2	15	38
9 674.1	1.188	$2,u$								1	15	<25
9 674.6	1.165	$2,g$	0	2	1	3	3	1	−1	3	15	59
9 675.1	1.186	$0,g^+$								1	15	<25
9 676.6	1.164	$0,g^+$	0	2	1	3	1	1	−1	3	15	68
9 677.1	1.175	$1,u$	1	1	0	6	2	1	−1	2	15	33
9 678.6	1.205	$0,g^+$								0	14	<25
9 678.9	1.194	$1,g$	0	1	0	1	1	10	0	1	14	37
		$1,g$	0	1	0	1	−1	10	2	1	14	36
9 679.7	1.187	$2,g$	0	1	0	12	2	0	0	1	15	25
9 679.7	1.176	$1,g$								2	15	<25
9 683.6	1.186	$2,u$	1	0	0	9	3	1	−1	1	15	32
9 684.0	1.175	$1,g$	0	0	2	3	3	2	−2	2	15	30
9 684.5	1.189	$0,u^-$	0	0	1	6	−4	4	4	1	15	32
9 684.6	1.186	$0,u^+$	1	0	0	9	1	1	−1	1	15	46
9 685.7	1.165	$0,g^-$	0	2	1	3	−1	1	1	3	15	84
9 687.5	1.188	$2,u$								1	15	<25
9 688.1	1.205	$2,g$								0	14	<25
9 690.5	1.201	$1,g$								0	15	<25
9 690.5	1.201	$1,u$								0	15	<25
9 690.5	1.173	$1,u$								2	15	<25
9 692.9	1.189	$0,g^-$	0	1	0	8	−4	4	4	1	15	28
9 693.8	1.165	$2,g$	0	2	1	3	1	1	1	3	15	75
9 695.1	1.188	$2,g$								1	15	<25
9 695.6	1.167	$0,u^+$	0	3	0	3	1	3	−1	3	15	32
9 696.4	1.175	$1,u$								2	15	<25
9 698.2	1.204	$0,g^-$	0	0	0	2	−2	12	2	0	14	33
		$0,g^-$	0	0	0	4	−2	10	2	0	14	31
9 700.1	1.188	$0,g^+$								1	15	<25
9 701.5	1.205	$0,u^+$								0	14	<25
9 702.0	1.175	$1,g$								2	15	<25
9 703.6	1.176	$1,g$								2	15	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 705.4	1.189	2,*u*								1	15	<25
9 707.2	1.188	2,*g*								1	15	<25
9 708.2	1.187	2,*g*	1	0	0	8	4	2	−2	1	15	42
9 709.1	1.176	1,*g*								2	15	<25
9 709.2	1.205	2,*g*								0	14	<25
9 709.5	1.189	0,u^+								1	15	<25
9 710.3	1.166	2,*u*								3	15	<25
9 711.9	1.205	2,*u*								0	14	<25
9 712.6	1.189	0,g^+								1	15	<25
9 713.0	1.168	0,u^-	0	3	0	3	−3	3	3	3	15	61
9 714.0	1.188	0,u^+	0	0	1	8	0	2	0	1	15	26
9 714.6	1.187	0,g^+	1	0	0	8	2	2	−2	1	15	25
9 714.7	1.176	1,*u*								2	15	<25
9 714.7	1.187	2,*u*								1	15	<25
9 715.7	1.186	0,u^-	1	0	0	9	−1	1	1	1	15	52
9 715.9	1.154	1,*u*	0	3	1	1	1	0	0	4	15	96
9 717.4	1.171	1,*g*	2	0	0	5	1	0	0	2	15	64
9 718.0	1.174	1,*u*	1	0	1	3	3	2	−2	2	15	41
9 719.5	1.194	1,*u*	0	1	0	0	0	11	1	1	14	77
9 722.7	1.146	0,g^+	0	5	0	0	0	0	0	5	15	100
9 725.1	1.187	2,*u*								1	15	<25
9 725.3	1.165	0,u^+	1	2	0	3	1	1	−1	3	15	61
9 725.9	1.189	2,*g*								1	15	<25
9 726.6	1.189	0,u^+								1	15	<25
9 727.3	1.177	1,*g*								2	15	<25
9 727.4	1.201	1,*g*								0	15	<25
9 727.5	1.201	1,*u*								0	15	<25
9 729.0	1.165	2,*u*	1	2	0	3	3	1	−1	3	15	61
9 731.6	1.188	2,*u*								1	15	<25
9 732.9	1.201	1,*u*								0	15	<25
9 732.9	1.189	0,u^-	0	1	0	7	−5	5	5	1	15	31
9 733.4	1.179	1,*u*	0	2	0	6	0	3	1	2	15	34
9 733.5	1.176	1,*g*	1	1	0	5	−1	2	2	2	15	27
9 733.8	1.202	1,*g*								0	15	<25
9 734.8	1.189	0,g^-	0	0	1	5	−5	5	5	1	15	27
9 735.4	1.188	2,*u*	0	0	1	6	6	4	−4	1	15	30
9 737.3	1.189	0,g^+								1	15	<25
9 738.4	1.188	2,*g*								1	15	<25
9 738.7	1.205	0,u^-	0	0	0	1	−1	13	1	0	14	52
9 739.2	1.164	0,u^-	1	2	0	3	−1	1	1	3	15	57
9 739.3	1.187	0,g^-	1	0	0	8	−2	2	2	1	15	46
9 741.7	1.165	0,u^+	0	1	2	1	1	1	−1	3	15	47
		0,u^+	0	3	0	3	1	3	−1	3	15	27
9 742.3	1.166	2,*u*	1	2	0	3	1	1	1	3	15	44
		2,*u*	0	3	0	3	3	3	−1	3	15	34
9 742.4	1.188	2,*u*	1	0	0	7	5	3	−3	1	15	34
9 745.0	1.167	0,u^+	0	3	0	3	3	3	−3	3	15	36
9 745.2	1.201	1,*u*								0	15	<25
9 746.6	1.177	1,*g*	0	1	1	4	4	3	−3	2	15	40
9 747.2	1.201	1,*g*								0	15	<25
9 748.6	1.189	0,g^-								1	15	<25
9 749.1	1.177	1,*u*								2	15	<25
9 749.3	1.205	2,*u*	0	0	0	1	−1	13	3	0	14	28
9 749.6	1.187	2,*g*								1	15	<25
9 749.6	1.189	0,u^-								1	15	<25
9 752.4	1.174	1,*u*	1	0	1	3	1	2	0	2	15	31
9 752.5	1.188	2,*g*								1	15	<25
9 753.2	1.188	0,u^+								1	15	<25
9 753.7	1.201	1,*g*	0	0	0	9	7	6	−6	0	15	25
9 755.8	1.167	2,*u*	0	3	0	3	−1	3	3	3	15	45
9 756.3	1.163	0,u^-	0	1	2	1	−1	1	1	3	15	60
		0,u^-	1	2	0	3	−1	1	1	3	15	29
9 756.6	1.189	2,*u*								1	15	<25
9 757.5	1.188	2,*g*								1	15	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 760.9	1.190	$0,g^+$	0	0	1	5	5	5	−5	1	15	27
		$0,g^+$	0	1	0	6	6	6	−6	1	15	35
9 761.3	1.201	$1,u$								0	15	<25
9 761.5	1.206	$0,g^+$	0	0	0	0	0	14	0	0	14	63
9 764.1	1.163	$2,u$	0	1	2	1	1	1	1	3	15	61
9 765.0	1.178	$1,g$								2	15	<25
9 766.0	1.177	$1,g$								2	15	<25
9 767.5	1.190	$0,g^+$								1	15	<25
9 768.0	1.189	$0,u^+$	0	1	0	7	5	5	−5	1	15	27
9 770.9	1.189	$2,g$								1	15	<25
9 771.3	1.177	$1,g$	1	1	0	5	1	2	0	2	15	28
9 771.7	1.174	$1,u$								2	15	<25
9 771.8	1.189	$2,u$								1	15	<25
9 772.8	1.188	$0,u^-$	1	0	0	7	−3	3	3	1	15	42
9 773.3	1.206	$2,g$	0	0	0	0	0	14	2	0	14	64
9 773.8	1.153	$1,g$	1	3	0	1	1	0	0	4	15	83
9 774.1	1.201	$1,g$								0	15	<25
9 774.2	1.162	$0,g^+$	1	1	1	1	1	1	−1	3	15	75
9 775.2	1.202	$1,u$	0	0	0	8	8	7	−7	0	15	55
9 775.2	1.176	$1,u$								2	15	<25
9 776.6	1.189	$0,u^-$								1	15	<25
9 780.0	1.188	$2,u$								1	15	<25
9 781.9	1.189	$0,g^-$	1	0	0	6	−4	4	4	1	15	28
		$0,g^-$	0	1	0	6	−6	6	6	1	15	37
9 782.8	1.187	$0,g^+$	1	0	0	8	0	2	0	1	15	26
9 784.4	1.189	$2,u$								1	15	<25
9 785.3	1.169	$0,u^-$	0	3	0	3	−1	3	1	3	15	84
9 785.6	1.187	$2,g$								1	15	<25
9 785.6	1.190	$0,u^+$								1	15	<25
9 787.0	1.189	$2,g$								1	15	<25
9 787.0	1.165	$0,u^+$	0	2	1	2	2	2	−2	3	15	47
9 789.1	1.176	$1,g$								2	15	<25
9 789.3	1.176	$1,u$	1	1	0	4	4	3	−3	2	15	39
9 790.6	1.157	$1,g$	0	4	0	1	1	2	0	4	15	32
		$1,g$	0	4	0	1	−1	2	2	4	15	52
9 790.9	1.202	$1,u$								0	15	<25
9 791.7	1.173	$1,u$	2	0	0	4	2	1	−1	2	15	33
9 792.7	1.162	$2,g$	1	1	1	1	1	1	1	3	15	70
9 792.7	1.174	$1,g$								2	15	<25
9 792.8	1.189	$0,g^-$	0	0	1	7	−1	3	1	1	15	28
9 793.1	1.169	$2,u$	0	3	0	3	1	3	1	3	15	51
9 793.3	1.162	$0,g^-$	1	1	1	1	−1	1	1	3	15	91
9 793.9	1.165	$0,u^-$	0	2	1	2	−2	2	2	3	15	74
9 795.6	1.202	$1,g$								0	15	<25
9 798.1	1.176	$1,u$								2	15	<25
9 800.5	1.165	$2,u$	0	2	1	2	2	2	0	3	15	62
9 801.9	1.202	$1,u$								0	15	<25
9 802.0	1.188	$2,g$								1	15	<25
9 802.2	1.189	$2,u$								1	15	<25
9 802.5	1.176	$1,u$								2	15	<25
9 804.0	1.190	$0,g^-$								1	15	<25
9 804.3	1.189	$0,g^+$								1	15	<25
9 805.8	1.166	$0,u^+$	0	2	1	2	2	2	−2	3	15	29
		$0,u^+$	0	2	1	2	0	2	0	3	15	58
9 808.3	1.187	$0,u^+$	1	0	0	7	3	3	−3	1	15	26
9 808.4	1.203	$1,g$								0	15	<25
9 808.7	1.190	$2,g$								1	15	<25
9 808.9	1.158	$1,g$	0	4	0	1	1	2	0	4	15	56
		$1,g$	0	4	0	1	−1	2	2	4	15	41
9 808.9	1.190	$0,g^+$	0	1	0	6	6	6	−6	1	15	35
9 809.7	1.174	$1,u$	2	0	0	4	0	1	1	2	15	27
9 811.8	1.175	$1,u$								2	15	<25
9 812.3	1.202	$1,u$								0	15	<25
9 812.6	1.188	$2,u$	1	0	0	7	−1	3	3	1	15	31

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 813.3	1.177	1,*g*	0	1	1	4	0	3	1	2	15	31
9 815.0	1.189	0,u^-								1	15	<25
9 816.3	1.189	0,g^-	1	0	0	6	−4	4	4	1	15	31
9 816.5	1.189	2,*g*								1	15	<25
9 817.1	1.166	2,*u*	0	2	1	2	0	2	2	3	15	67
9 818.6	1.165	0,g^+								3	15	<25
9 820.3	1.161	0,g^+	2	1	0	2	0	0	0	3	15	62
9 821.3	1.189	0,u^-	1	0	0	5	−5	5	5	1	15	29
9 822.3	1.174	1,*g*	1	0	1	2	2	3	−1	2	15	26
		1,*g*	1	0	1	2	−2	3	3	2	15	47
9 823.3	1.160	2,*g*	2	1	0	2	2	0	0	3	15	77
9 824.0	1.189	2,*g*								1	15	<25
9 825.0	1.189	2,*u*								1	15	<25
9 825.5	1.177	1,*u*								2	15	<25
9 827.5	1.200	1,*g*	0	0	0	15	1	0	0	0	15	42
9 829.9	1.202	1,*u*								0	15	<25
9 830.3	1.177	1,*u*								2	15	<25
9 830.6	1.189	0,u^+								1	15	<25
9 831.6	1.180	1,*g*	0	2	0	5	1	4	0	2	15	28
		1,*g*	0	2	0	5	−1	4	2	2	15	26
9 832.7	1.190	0,g^+								1	15	<25
9 835.4	1.189	2,*u*								1	15	<25
9 835.6	1.158	0,u^+	2	0	1	0	0	0	0	3	15	68
		0,u^+	0	0	3	0	0	0	0	3	15	30
9 836.0	1.166	2,*g*								3	15	<25
9 836.2	1.190	0,u^+	1	0	0	5	5	5	−5	1	15	27
9 837.4	1.202	1,*g*								0	15	<25
9 839.6	1.165	0,g^-	1	2	0	2	−2	2	2	3	15	76
9 840.7	1.190	2,*g*								1	15	<25
9 842.5	1.188	0,g^+								1	15	<25
9 842.6	1.189	2,*u*								1	15	<25
9 844.6	1.177	1,*u*								2	15	<25
9 845.6	1.167	0,g^+	1	2	0	2	2	2	−2	3	15	44
9 846.9	1.190	0,g^-								1	15	<25
9 848.8	1.189	2,*g*	1	0	0	6	−2	4	4	1	15	28
9 851.3	1.175	1,*g*								2	15	<25
9 852.2	1.189	0,u^+	1	0	0	5	5	5	−5	1	15	39
9 853.2	1.205	0,u^-	0	0	0	3	−1	11	1	0	14	34
9 853.3	1.202	1,*u*								0	15	<25
9 853.6	1.190	0,u^-	1	0	0	5	−5	5	5	1	15	42
9 853.8	1.202	1,*g*								0	15	<25
9 854.1	1.205	0,g^+								0	14	<25
9 855.0	1.190	2,*u*								1	15	<25
9 855.8	1.190	0,g^+								1	15	<25
9 855.9	1.189	2,*g*								1	15	<25
9 856.5	1.177	1,*g*								2	15	<25
9 856.6	1.187	0,u^-	1	0	0	7	−1	3	1	1	15	34
9 858.0	1.167	2,*g*	1	2	0	2	2	2	0	3	15	48
		2,*g*	0	3	0	2	−2	4	4	3	15	29
9 859.1	1.203	1,*g*	0	0	0	7	−7	8	8	0	15	43
9 859.9	1.173	1,*g*								2	15	<25
9 859.9	1.178	1,*u*	0	1	1	3	3	4	−2	2	15	26
		1,*u*	0	1	1	3	−3	4	4	2	15	33
9 861.7	1.188	2,*u*								1	15	<25
9 861.9	1.165	0,g^+	1	2	0	2	0	2	0	3	15	54
9 862.9	1.205	2,*u*								0	14	<25
9 864.0	1.205	2,*g*								0	14	<25
9 864.2	1.178	1,*u*								2	15	<25
9 866.1	1.190	2,*g*								1	15	<25
9 867.1	1.169	0,g^-	0	3	0	2	−2	4	2	3	15	77
9 869.1	1.155	1,*g*	0	3	1	0	0	1	1	4	15	96
9 869.2	1.166	2,*g*	1	2	0	2	0	2	2	3	15	55
		2,*g*	0	3	0	2	2	4	0	3	15	28
9 870.0	1.178	1,*u*								2	15	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 870.0	1.190	2,*u*	1	0	0	5	5	5	−3	1	15	26
9 872.6	1.190	0,g^+								1	15	<25
9 873.0	1.190	0,u^+								1	15	<25
9 874.1	1.202	1,*u*								0	15	<25
9 875.5	1.173	1,*g*	2	0	0	3	−1	2	2	2	15	31
9 877.8	1.164	0,g^+	0	1	2	0	0	2	0	3	15	66
9 878.7	1.203	1,*g*								0	15	<25
9 879.0	1.190	0,u^+	0	0	1	4	4	6	−4	1	15	28
9 879.5	1.203	1,*u*								0	15	<25
9 880.6	1.168	2,*g*	0	3	0	2	−2	4	4	3	15	40
9 881.9	1.188	0,g^-	1	0	0	6	−2	4	2	1	15	36
9 883.1	1.189	2,*u*								1	15	<25
9 884.8	1.177	1,*u*								2	15	<25
9 885.7	1.190	0,u^-								1	15	<25
9 886.4	1.203	1,*g*								0	15	<25
9 886.6	1.190	2,*g*								1	15	<25
9 887.2	1.190	0,u^+	0	1	0	5	5	7	−5	1	15	26
9 889.7	1.178	1,*g*								2	15	<25
9 889.8	1.189	2,*g*								1	15	<25
9 890.1	1.190	2,*u*								1	15	<25
9 891.9	1.164	2,*g*	0	1	2	0	0	2	2	3	15	71
9 893.0	1.190	2,*u*								1	15	<25
9 894.2	1.176	1,*g*								2	15	<25
9 895.5	1.190	0,g^+								1	15	<25
9 896.6	1.204	1,*u*								0	15	<25
9 899.6	1.177	1,*g*								2	15	<25
9 905.2	1.190	2,*g*								1	15	<25
9 905.4	1.172	1,*g*	2	0	0	3	1	2	0	2	15	46
9 906.4	1.190	2,*u*	0	1	0	5	−5	7	7	1	15	28
9 907.2	1.169	0,g^+	0	3	0	2	2	4	−2	3	15	37
		0,g^+	0	3	0	2	0	4	0	3	15	56
9 908.8	1.175	1,*u*	1	0	1	1	1	4	0	2	15	34
		1,*u*	1	0	1	1	−1	4	2	2	15	26
9 909.5	1.162	0,u^+	1	1	1	0	0	2	0	3	15	60
9 910.8	1.189	0,u^-	0	0	1	4	−4	6	4	1	15	35
9 912.6	1.178	1,*u*	0	1	1	3	1	4	0	2	15	28
9 913.3	1.190	0,g^-								1	15	<25
9 914.0	1.166	0,g^+	0	2	1	1	1	3	−1	3	15	72
9 914.2	1.176	1,*g*								2	15	<25
9 916.6	1.169	2,*g*	0	3	0	2	2	4	0	3	15	32
		2,*g*	0	3	0	2	0	4	2	3	15	50
9 919.1	1.190	0,u^-								1	15	<25
9 919.4	1.203	1,*u*								0	15	<25
9 920.3	1.203	1,*g*								0	15	<25
9 922.8	1.190	2,*u*								1	15	<25
9 923.6	1.177	1,*g*	1	1	0	3	−3	4	4	2	15	26
9 923.7	1.189	0,g^-	1	0	0	4	−4	6	4	1	15	38
9 923.8	1.190	2,*g*								1	15	<25
9 924.7	1.191	0,g^+								1	15	<25
9 925.0	1.191	0,u^+	0	1	0	5	5	7	−5	1	15	28
9 925.1	1.162	2,*u*	1	1	1	0	0	2	2	3	15	68
9 926.4	1.191	2,*u*								1	15	<25
9 927.4	1.178	1,*g*	0	2	0	3	−3	6	4	2	15	26
9 927.7	1.167	0,g^-	0	2	1	1	−1	3	1	3	15	90
9 928.4	1.166	2,*g*	0	2	1	1	1	3	1	3	15	53
9 928.8	1.154	1,*u*	1	3	0	0	0	1	1	4	15	91
9 931.2	1.181	1,*u*	0	2	0	4	0	5	1	2	15	32
9 934.6	1.188	0,g^+								1	15	<25
9 935.4	1.190	2,*u*								1	15	<25
9 936.2	1.189	2,*g*								1	15	<25
9 936.5	1.161	0,u^+	2	1	0	1	1	1	−1	3	15	65
		0,u^+	1	1	1	0	0	2	0	3	15	30
9 937.4	1.191	0,u^-								1	15	<25
9 938.4	1.202	1,*g*								0	15	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 939.6	1.161	$0,u^-$	2	1	0	1	−1	1	1	3	15	87
9 940.0	1.190	$2,g$								1	15	<25
9 941.8	1.167	$2,g$	0	2	1	1	1	3	1	3	15	29
		$2,g$	0	2	1	1	−1	3	3	3	15	55
9 942.3	1.189	$2,g$								1	15	<25
9 943.6	1.204	$1,u$								0	15	<25
9 945.1	1.204	$1,g$								0	15	<25
9 947.7	1.191	$2,u$								1	15	<25
9 949.0	1.178	$1,g$								2	15	<25
9 949.5	1.204	$1,u$								0	15	<25
9 951.5	1.174	$1,u$	1	0	1	1	1	4	0	2	15	29
		$1,u$	1	0	1	1	−1	4	2	2	15	36
9 954.1	1.161	$2,u$	2	1	0	1	1	1	1	3	15	70
9 954.7	1.190	$0,g^+$	1	0	0	4	4	6	−4	1	15	27
9 954.9	1.190	$0,g^-$								1	15	<25
9 956.1	1.166	$0,u^+$	1	2	0	1	1	3	−1	3	15	58
		$0,u^+$	0	3	0	1	1	5	−1	3	15	25
9 956.3	1.188	$0,u^+$	1	0	0	5	3	5	−3	1	15	29
9 962.6	1.158	$1,u$	0	4	0	0	0	3	1	4	15	91
9 963.3	1.179	$1,g$								2	15	<25
9 963.4	1.191	$0,g^-$	0	1	0	4	−4	8	4	1	15	34
9 963.5	1.173	$1,u$	2	0	0	2	−2	3	3	2	15	26
9 965.1	1.190	$2,g$								1	15	<25
9 965.1	1.189	$2,u$								1	15	<25
9 965.3	1.204	$1,g$								0	15	<25
9 967.9	1.190	$2,g$	1	0	0	4	−4	6	6	1	15	29
9 968.7	1.179	$1,g$								2	15	<25
9 969.5	1.191	$0,u^+$	1	0	0	3	1	7	−1	1	15	26
9 971.3	1.167	$2,u$	1	2	0	1	1	3	1	3	15	35
		$2,u$	1	2	0	1	−1	3	3	3	15	27
9 972.8	1.179	$1,u$								2	15	<25
9 974.4	1.189	$0,g^+$								1	15	<25
9 974.6	1.191	$0,u^-$								1	15	<25
9 977.2	1.191	$2,g$								1	15	<25
9 978.9	1.178	$1,g$	0	1	1	2	2	5	−1	2	15	28
		$1,g$	0	1	1	2	−2	5	3	2	15	26
9 980.1	1.173	$1,u$	2	0	0	2	2	3	−1	2	15	28
		$1,u$	2	0	0	2	−2	3	3	2	15	41
9 980.6	1.204	$1,u$								0	15	<25
9 985.2	1.191	$2,u$								1	15	<25
9 985.3	1.191	$2,u$								1	15	<25
9 985.4	1.166	$0,u^-$	1	2	0	1	−1	3	1	3	15	87
9 987.3	1.190	$2,g$								1	15	<25
9 990.4	1.169	$0,u^+$	1	2	0	1	1	3	−1	3	15	30
		$0,u^+$	0	3	0	1	1	5	−1	3	15	66
9 991.1	1.203	$1,g$								0	15	<25
9 992.3	1.156	$0,g^+$	3	0	0	0	0	0	0	3	15	92
9 997.0	1.166	$2,u$	1	2	0	1	1	3	1	3	15	27
		$2,u$	1	2	0	1	−1	3	3	3	15	60
9 997.9	1.191	$0,g^-$	0	0	1	3	−3	7	3	1	15	32
9 999.4	1.191	$0,u^+$								1	15	<25
10 001.4	1.202	$1,u$								0	15	<25
10 002.2	1.192	$0,g^+$								1	15	<25
10 003.8	1.173	$1,u$	2	0	0	2	0	3	1	2	15	50
10 004.4	1.169	$2,u$	1	2	0	1	1	3	1	3	15	26
		$2,u$	0	3	0	1	−1	5	3	3	15	42
10 007.7	1.191	$2,u$								1	15	<25
10 008.7	1.191	$2,g$	0	0	1	3	−3	7	5	1	15	26
10 010.1	1.179	$1,g$	0	1	1	2	0	5	1	2	15	39
10 012.1	1.177	$1,u$	0	0	2	0	0	5	1	2	15	42
10 013.3	1.191	$2,g$								1	15	<25
10 014.1	1.188	$0,u^-$	1	0	0	5	−1	5	1	1	15	31
10 015.2	1.192	$0,g^+$								1	15	<25
10 015.4	1.205	$1,g$								0	15	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 017.9	1.205	1,*u*								0	15	<25
10 018.0	1.178	1,*u*	1	1	0	2	−2	5	3	2	15	34
10 019.1	1.179	1,*u*	1	1	0	2	2	5	−1	2	15	34
10 022.0	1.189	2,*u*								1	15	<25
10 023.6	1.192	0,u^+	0	1	0	3	1	9	−1	1	15	33
10 025.4	1.191	2,*g*								1	15	<25
10 029.1	1.189	0,g^-	1	0	0	4	−2	6	2	1	15	42
10 029.7	1.170	0,u^-	0	3	0	1	−1	5	1	3	15	90
10 030.1	1.181	1,*g*	0	2	0	3	1	6	0	2	15	30
		1,*g*	0	2	0	3	−1	6	2	2	15	30
10 034.4	1.190	0,u^-	1	0	0	3	−3	7	3	1	15	53
10 035.6	1.191	0,u^+								1	15	<25
10 038.5	1.192	2,*u*								1	15	<25
10 039.4	1.190	2,*g*								1	15	<25
10 040.3	1.175	1,*g*	1	0	1	0	0	5	1	2	15	61
10 040.7	1.170	2,*u*	0	3	0	1	1	5	1	3	15	54
		2,*u*	0	3	0	1	−1	5	3	3	15	36
10 041.4	1.204	1,*g*								0	15	<25
10 043.6	1.205	1,*u*								0	15	<25
10 046.1	1.190	2,*u*								1	15	<25
10 048.3	1.190	2,*u*								1	15	<25
10 048.4	1.168	0,u^+	0	2	1	0	0	4	0	3	15	91
10 048.9	1.192	0,g^+								1	15	<25
10 053.2	1.204	1,*u*								0	15	<25
10 054.6	1.192	0,u^+	0	0	1	2	2	8	−2	1	15	33
10 059.0	1.180	1,*u*	0	1	1	1	−1	6	2	2	15	28
		1,*u*	0	2	0	2	2	7	−1	2	15	29
10 061.1	1.191	2,*g*								1	15	<25
10 062.9	1.162	0,g^+	2	1	0	0	0	2	0	3	15	82
10 063.0	1.180	1,*u*	0	1	1	1	1	6	0	2	15	29
		1,*u*	0	2	0	2	−2	7	3	2	15	31
10 063.0	1.168	2,*u*	0	2	1	0	0	4	2	3	15	88
10 067.9	1.167	1,*g*	0	3	0	7	1	0	0	3	16	88
10 068.7	1.203	1,*g*								0	15	<25
10 069.4	1.192	2,*u*								1	15	<25
10 069.4	1.178	1,*u*	1	1	0	2	0	5	1	2	15	46
10 073.0	1.206	1,*g*								0	15	<25
10 077.4	1.162	2,*g*	2	1	0	0	0	2	2	3	15	85
10 078.1	1.192	0,g^-								1	15	<25
10 079.9	1.192	0,u^-								1	15	<25
10 080.0	1.174	1,*g*	2	0	0	1	1	4	0	2	15	28
		1,*g*	2	0	0	1	−1	4	2	2	15	36
		1,*g*	1	0	1	0	0	5	1	2	15	30
10 080.8	1.191	0,g^+	1	0	0	2	2	8	−2	1	15	30
10 086.6	1.192	2,*g*								1	15	<25
10 091.7	1.193	0,u^-								1	15	<25
10 092.1	1.192	2,*u*								1	15	<25
10 092.7	1.189	0,g^+								1	15	<25
10 093.8	1.205	1,*u*								0	15	<25
10 096.1	1.191	2,*g*	1	0	0	2	0	8	2	1	15	26
10 098.2	1.190	0,u^+	1	0	0	3	3	7	−3	1	15	40
10 100.0	1.192	2,*u*								1	15	<25
10 101.5	1.175	0,g^+								2	16	<25
10 101.6	1.190	2,*g*								1	15	<25
10 101.7	1.174	1,*g*	2	0	0	1	1	4	0	2	15	40
		1,*g*	2	0	0	1	−1	4	2	2	15	42
10 102.7	1.157	0,g^+	0	4	0	4	0	0	0	4	16	98
10 103.0	1.179	1,*g*	1	1	0	1	1	6	0	2	15	26
		1,*g*	1	1	0	1	−1	6	2	2	15	30
10 103.5	1.180	1,*u*	0	1	1	1	1	6	0	2	15	38
		1,*u*	0	1	1	1	−1	6	2	2	15	40
10 103.7	1.175	0,u^+								2	16	<25
10 105.9	1.157	2,*g*	0	4	0	4	2	0	0	4	16	98
10 106.1	1.167	0,g^+	1	2	0	0	0	4	0	3	15	73

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 106.4	1.175	2,*g*								2	16	<25
10 108.6	1.176	2,*u*								2	16	<25
10 109.9	1.190	2,*u*								1	15	<25
10 111.7	1.192	0,g^-								1	15	<25
10 114.4	1.204	1,*g*								0	15	<25
10 115.2	1.192	0,u^-	0	0	1	2	−2	8	2	1	15	47
10 117.6	1.168	1,*u*	0	3	0	6	2	1	−1	3	16	45
		1,*u*	0	3	0	6	0	1	1	3	16	28
10 119.7	1.167	2,*g*	1	2	0	0	0	4	2	3	15	77
10 123.4	1.191	2,*g*								1	15	<25
10 126.1	1.182	1,*u*	0	2	0	2	0	7	1	2	15	42
10 128.7	1.192	2,*u*	0	0	1	2	−2	8	4	1	15	31
10 132.2	1.176	0,g^+	0	0	2	6	0	0	0	2	16	26
		0,g^+	0	2	0	10	0	0	0	2	16	41
10 134.2	1.193	0,g^+	0	1	0	2	2	10	−2	1	15	27
		0,g^+	0	1	0	2	0	10	0	1	15	26
10 135.7	1.205	1,*u*								0	15	<25
10 135.7	1.176	2,*g*	0	0	2	6	2	0	0	2	16	28
		2,*g*	0	2	0	10	2	0	0	2	16	41
10 137.3	1.204	1,*u*								0	15	<25
10 144.4	1.206	1,*g*								0	15	<25
10 148.5	1.193	2,*g*	0	1	0	2	0	10	2	1	15	26
10 149.3	1.182	1,*g*	0	2	0	1	1	8	0	2	15	32
		1,*g*	0	2	0	1	−1	8	2	2	15	32
10 150.3	1.193	0,u^+								1	15	<25
10 150.8	1.171	0,g^+	0	3	0	0	0	6	0	3	15	82
10 151.0	1.176	0,u^+	0	2	0	9	1	1	−1	2	16	39
10 154.0	1.205	1,*g*	0	0	0	3	−3	12	4	0	15	26
10 154.1	1.176	2,*u*	1	0	1	6	2	0	0	2	16	25
		2,*u*	0	2	0	9	3	1	−1	2	16	29
10 154.4	1.188	1,*g*								1	16	<25
10 154.4	1.188	1,*u*								1	16	<25
10 160.8	1.178	1,*g*	1	1	0	1	1	6	0	2	15	43
		1,*g*	1	1	0	1	−1	6	2	2	15	40
10 161.1	1.190	0,g^-	1	0	0	2	−2	8	2	1	15	72
10 161.2	1.193	2,*u*								1	15	<25
10 161.3	1.177	0,g^+								2	16	<25
10 161.8	1.193	0,g^+	0	0	1	1	1	9	−1	1	15	60
10 163.4	1.177	2,*g*	0	2	0	8	4	2	−2	2	16	25
10 163.7	1.171	2,*g*	0	3	0	0	0	6	2	3	15	83
10 165.5	1.168	1,*u*	0	3	0	6	2	1	−1	3	16	41
		1,*u*	0	3	0	6	0	1	1	3	16	48
10 168.6	1.190	0,u^-	1	0	0	3	−1	7	1	1	15	39
10 169.4	1.193	0,g^+								1	15	<25
10 171.0	1.191	2,*g*	1	0	0	2	−2	8	4	1	15	33
10 173.8	1.176	0,u^+	0	1	1	8	0	0	0	2	16	38
10 176.6	1.176	2,*u*	0	1	1	8	2	0	0	2	16	34
10 177.1	1.193	2,*g*								1	15	<25
10 177.5	1.190	2,*u*								1	15	<25
10 178.2	1.205	1,*u*								0	15	<25
10 178.4	1.166	1,*u*	0	2	1	5	1	0	0	3	16	67
10 180.5	1.193	2,*g*								1	15	<25
10 181.3	1.178	0,u^-	0	2	0	9	−1	1	1	2	16	51
10 181.4	1.192	0,u^+								1	15	<25
10 182.9	1.167	1,*g*								3	16	<25
10 187.7	1.178	2,*u*	0	2	0	9	1	1	1	2	16	34
10 188.0	1.180	1,*g*	0	1	1	0	0	7	1	2	15	84
10 190.3	1.207	1,*u*	0	0	0	2	0	13	1	0	15	29
10 190.4	1.177	0,g^-	0	1	1	7	−1	1	1	2	16	26
		0,g^-	0	2	0	8	−2	2	2	2	16	33
10 193.6	1.175	1,*u*	2	0	0	0	0	5	1	2	15	82
10 194.6	1.192	2,*u*								1	15	<25
10 196.4	1.177	2,*g*								2	16	<25
10 204.1	1.192	0,u^+	1	0	0	1	1	9	−1	1	15	64

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 204.7	1.175	$0,g^+$								2	16	<25
10 205.4	1.204	$1,g$								0	15	<25
10 206.7	1.177	$0,u^+$								2	16	<25
10 206.8	1.177	$2,u$								2	16	<25
10 208.6	1.158	$0,u^+$	0	4	0	3	1	1	−1	4	16	93
10 208.7	1.175	$2,g$	1	0	1	5	3	1	−1	2	16	25
10 209.6	1.158	$2,u$	0	4	0	3	3	1	−1	4	16	80
10 210.2	1.165	$1,g$	0	1	2	3	1	0	0	3	16	33
10 213.3	1.176	$0,u^-$	0	0	2	5	−1	1	1	2	16	40
10 215.3	1.188	$1,u$	0	0	1	11	1	0	0	1	16	28
10 216.2	1.160	$1,u$	2	0	1	1	1	0	0	3	16	29
		$1,u$	0	0	3	1	1	0	0	3	16	58
10 216.6	1.183	$1,g$	0	2	0	1	1	8	0	2	15	42
		$1,g$	0	2	0	1	−1	8	2	2	15	43
10 216.8	1.194	$0,g^-$	0	1	0	2	−2	10	2	1	15	45
10 217.6	1.188	$1,g$								1	16	<25
10 217.7	1.192	$2,u$	1	0	0	1	1	9	1	1	15	32
		$2,u$	1	0	0	1	−1	9	3	1	15	31
10 218.8	1.176	$2,u$	0	0	2	5	3	1	−1	2	16	32
10 221.6	1.176	$0,g^+$	0	1	1	7	1	1	−1	2	16	38
10 222.1	1.189	$1,u$								1	16	<25
10 222.3	1.189	$1,g$								1	16	<25
10 224.1	1.176	$2,g$	0	1	1	7	3	1	−1	2	16	29
10 224.4	1.168	$1,g$	0	3	0	5	3	2	−2	3	16	29
		$1,g$	0	3	0	5	−1	2	2	3	16	41
10 226.8	1.176	$2,u$	1	0	1	6	2	0	0	2	16	31
10 227.1	1.175	$0,u^+$	1	0	1	6	0	0	0	2	16	33
10 228.5	1.193	$2,g$								1	15	<25
10 234.1	1.162	$1,g$	1	0	2	1	1	0	0	3	16	49
		$1,g$	1	2	0	5	1	0	0	3	16	32
10 234.3	1.206	$1,g$								0	15	<25
10 235.7	1.176	$0,g^-$	1	0	1	5	−1	1	1	2	16	33
		$0,g^-$	0	2	0	8	−2	2	2	2	16	36
10 235.8	1.158	$0,u^-$	0	4	0	3	−1	1	1	4	16	99
10 238.4	1.176	$2,g$								2	16	<25
10 238.8	1.190	$0,g^+$	1	0	0	2	2	8	−2	1	15	26
		$0,g^+$	1	0	0	2	0	8	0	1	15	30
10 241.8	1.158	$2,u$	0	4	0	3	1	1	1	4	16	82
10 242.9	1.193	$0,g^-$	0	0	1	1	−1	9	1	1	15	49
		$0,g^-$	0	1	0	2	−2	10	2	1	15	25
10 243.6	1.194	$0,u^-$	0	1	0	1	−1	11	1	1	15	33
10 244.9	1.178	$0,u^-$	0	2	0	7	−3	3	3	2	16	41
10 245.0	1.180	$1,u$	1	1	0	0	0	7	1	2	15	72
10 245.0	1.176	$0,g^+$	1	1	0	8	0	0	0	2	16	34
10 247.1	1.191	$2,g$								1	15	<25
10 247.5	1.203	$0,u^+$	0	0	0	9	1	7	−1	0	16	26
		$0,u^+$	0	0	0	11	1	5	−1	0	16	30
10 247.5	1.203	$0,g^+$								0	16	<25
10 247.7	1.163	$1,g$	0	1	2	3	1	0	0	3	16	31
		$1,g$	1	2	0	5	1	0	0	3	16	37
10 247.9	1.176	$2,g$								2	16	<25
10 250.1	1.189	$1,g$								1	16	<25
10 250.6	1.178	$2,u$								2	16	<25
10 251.8	1.189	$1,u$								1	16	<25
10 254.0	1.194	$2,u$								1	15	<25
10 255.3	1.203	$2,u$								0	16	<25
10 255.3	1.203	$2,g$								0	16	<25
10 256.6	1.163	$1,u$	1	1	1	3	1	0	0	3	16	48
10 257.9	1.192	$2,g$								1	15	<25
10 258.0	1.189	$1,g$								1	16	<25
10 258.2	1.195	$0,u^+$	0	1	0	1	1	11	−1	1	15	54
10 258.9	1.178	$2,g$								2	16	<25
10 258.9	1.178	$0,g^+$								2	16	<25
10 260.9	1.177	$0,g^-$	0	1	1	7	−1	1	1	2	16	44

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 262.5	1.177	$0,u^+$	1	1	0	7	1	1	−1	2	16	44
10 263.0	1.206	$1,g$								0	15	<25
10 263.3	1.177	$2,u$	1	1	0	7	3	1	−1	2	16	32
10 263.8	1.206	$1,u$								0	15	<25
10 264.6	1.188	$1,u$	0	0	1	11	1	0	0	1	16	29
10 266.5	1.177	$2,g$	0	1	1	7	1	1	1	2	16	30
10 267.1	1.179	$0,g^+$	0	2	0	8	0	2	0	2	16	29
10 268.2	1.147	$1,g$	0	5	0	1	1	0	0	5	16	100
10 271.9	1.195	$2,u$	0	1	0	1	−1	11	3	1	15	34
10 272.4	1.205	$1,u$								0	15	<25
10 272.5	1.168	$1,g$	0	3	0	5	1	2	0	3	16	29
10 273.4	1.189	$1,u$								1	16	<25
10 273.5	1.189	$1,g$								1	16	<25
10 274.0	1.179	$2,g$								2	16	<25
10 274.4	1.167	$1,g$	0	2	1	4	2	1	−1	3	16	41
		$1,g$	0	3	0	5	1	2	0	3	16	26
10 277.2	1.168	$1,u$	0	3	0	4	4	3	−3	3	16	27
10 277.4	1.175	$0,u^+$								2	16	<25
10 279.7	1.193	$0,u^+$	0	0	1	0	0	10	0	1	15	63
10 283.1	1.178	$0,u^+$								2	16	<25
10 284.7	1.189	$1,u$								1	16	<25
10 284.9	1.176	$2,u$								2	16	<25
10 286.1	1.176	$2,g$	0	0	2	4	4	2	−2	2	16	26
		$2,g$	0	2	0	6	6	4	−4	2	16	27
10 287.8	1.166	$1,g$	0	2	1	4	0	1	1	3	16	59
10 288.1	1.155	$0,u^+$	0	3	1	2	0	0	0	4	16	93
10 288.9	1.178	$0,g^-$								2	16	<25
10 289.4	1.178	$2,u$								2	16	<25
10 290.8	1.177	$2,g$								2	16	<25
10 291.0	1.176	$0,g^+$	1	0	1	5	1	1	−1	2	16	26
10 291.1	1.155	$2,u$	0	3	1	2	2	0	0	4	16	94
10 291.8	1.177	$2,u$	0	1	1	6	4	2	−2	2	16	40
10 292.1	1.193	$2,u$	0	0	1	0	0	10	2	1	15	61
10 293.8	1.206	$1,u$	0	0	0	2	−2	13	3	0	15	32
10 294.7	1.189	$1,g$								1	16	<25
10 296.1	1.177	$0,u^-$								2	16	<25
10 297.4	1.190	$1,u$								1	16	<25
10 297.6	1.183	$1,u$	0	2	0	0	0	9	1	2	15	80
10 297.6	1.177	$0,u^+$	0	1	1	6	2	2	−2	2	16	29
10 297.8	1.190	$1,g$								1	16	<25
10 298.0	1.169	$1,u$	0	3	0	4	4	3	−3	3	16	29
10 300.2	1.189	$1,g$								1	16	<25
10 300.7	1.191	$0,u^-$	1	0	0	1	−1	9	1	1	15	71
10 301.0	1.190	$1,u$								1	16	<25
10 303.5	1.204	$0,u^-$								0	16	<25
10 303.5	1.204	$0,g^-$								0	16	<25
10 304.5	1.177	$2,u$								2	16	<25
10 307.4	1.175	$0,u^-$	1	0	1	4	−2	2	2	2	16	29
10 307.6	1.195	$0,g^+$	0	1	0	0	0	12	0	1	15	30
10 308.1	1.176	$0,g^+$								2	16	<25
10 308.5	1.204	$2,u$								0	16	<25
10 308.5	1.204	$2,g$								0	16	<25
10 311.6	1.176	$2,g$	0	0	2	4	2	2	0	2	16	31
10 312.5	1.176	$0,g^-$	1	0	1	5	−1	1	1	2	16	28
		$0,g^-$	0	0	2	4	−2	2	2	2	16	31
10 312.7	1.190	$1,u$								1	16	<25
10 313.6	1.191	$2,u$	1	0	0	1	1	9	1	1	15	39
		$2,u$	1	0	0	1	−1	9	3	1	15	31
10 313.9	1.175	$2,u$	1	0	1	4	4	2	−2	2	16	32
10 314.0	1.207	$1,g$	0	0	0	1	1	14	0	0	15	34
		$1,g$	0	0	0	1	−1	14	2	0	15	26
10 314.4	1.166	$1,u$	1	2	0	4	2	1	−1	3	16	31
10 315.1	1.177	$2,g$								2	16	<25
10 317.1	1.177	$0,g^+$	1	1	0	6	2	2	−2	2	16	35

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 319.5	1.195	2,g	0	1	0	0	0	12	2	1	15	29
10 320.1	1.177	2,g								2	16	<25
10 322.5	1.177	0,u^-	0	1	1	6	−2	2	2	2	16	39
10 322.7	1.190	1,g								1	16	<25
10 325.7	1.190	1,g								1	16	<25
10 325.8	1.177	2,u								2	16	<25
10 326.5	1.165	1,u	0	1	2	2	2	1	−1	3	16	34
		1,u	1	2	0	4	2	1	−1	3	16	29
10 327.6	1.190	1,u								1	16	<25
10 328.1	1.203	0,u^+	0	0	0	13	1	3	−1	0	16	29
10 328.1	1.203	0,g^+								0	16	<25
10 328.6	1.188	1,g								1	16	<25
10 328.8	1.177	0,u^+								2	16	<25
10 328.9	1.166	1,u								3	16	<25
10 330.2	1.158	0,g^+	0	4	0	2	2	2	−2	4	16	43
		0,g^+	0	4	0	2	0	2	0	4	16	28
10 332.6	1.179	0,u^+								2	16	<25
10 333.6	1.203	2,u								0	16	<25
10 333.6	1.203	2,g								0	16	<25
10 333.8	1.206	1,g								0	15	<25
10 335.9	1.178	0,g^+	0	2	0	6	4	4	−4	2	16	31
10 336.3	1.188	1,u								1	16	<25
10 338.0	1.177	2,u								2	16	<25
10 338.4	1.169	1,u	0	3	0	4	2	3	−1	3	16	27
		1,u	0	3	0	4	−2	3	3	3	16	39
10 338.7	1.173	0,g^+	2	0	0	6	0	0	0	2	16	60
10 339.6	1.174	2,g	2	0	0	6	2	0	0	2	16	49
10 340.6	1.192	0,g^+	1	0	0	0	0	10	0	1	15	68
10 343.1	1.155	2,g	1	3	0	2	2	0	0	4	16	69
10 343.2	1.162	1,g	0	0	3	0	0	1	1	3	16	38
10 343.3	1.177	2,g								2	16	<25
10 344.5	1.190	1,u								1	16	<25
10 344.6	1.189	1,g	1	0	0	9	1	2	0	1	16	28
10 345.2	1.177	0,g^-	1	1	0	6	−2	2	2	2	16	52
10 347.1	1.179	2,u								2	16	<25
10 347.4	1.155	0,g^+	1	3	0	2	0	0	0	4	16	74
10 347.7	1.191	1,g								1	16	<25
10 348.2	1.178	2,g	0	1	1	5	5	3	−3	2	16	45
10 348.3	1.159	0,g^-	0	4	0	2	−2	2	2	4	16	95
10 350.4	1.164	1,u	1	2	0	4	0	1	1	3	16	39
10 352.0	1.162	1,g	1	1	1	2	2	1	−1	3	16	38
10 352.6	1.179	0,u^-	0	2	0	5	−5	5	5	2	16	26
10 353.3	1.177	2,g	1	1	0	6	4	2	−2	2	16	28
10 353.5	1.192	2,g	1	0	0	0	0	10	2	1	15	70
10 354.7	1.177	0,u^+								2	16	<25
10 357.1	1.180	0,u^-	0	2	0	7	−1	3	1	2	16	42
10 357.8	1.190	1,u								1	16	<25
10 357.8	1.188	1,g	0	1	0	13	1	0	0	1	16	27
10 359.0	1.158	2,g	1	3	0	2	2	0	0	4	16	28
		2,g	0	4	0	2	2	2	0	4	16	42
		2,g	0	4	0	2	0	2	2	4	16	28
10 360.6	1.178	0,g^+								2	16	<25
10 361.6	1.178	2,u								2	16	<25
10 364.1	1.176	0,u^+	0	0	2	3	1	3	−1	2	16	27
10 365.1	1.161	1,u	1	0	2	0	0	1	1	3	16	74
10 365.1	1.189	1,u								1	16	<25
10 365.4	1.175	0,g^+	1	0	1	3	1	3	−1	2	16	28
10 365.7	1.179	2,u								2	16	<25
10 366.5	1.204	0,u^+								0	16	<25
10 366.5	1.204	0,g^+								0	16	<25
10 367.7	1.203	2,u								0	16	<25
10 367.7	1.203	2,g	0	0	0	10	8	6	−6	0	16	29
10 369.4	1.203	0,u^-	0	0	0	9	−5	7	5	0	16	26
10 369.4	1.203	0,g^-	0	0	0	12	−2	4	2	0	16	25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 369.8	1.189	1,*u*								1	16	<25
10 369.8	1.190	1,*g*								1	16	<25
10 371.8	1.166	1,*u*	0	2	1	3	3	2	−2	3	16	54
10 372.4	1.195	0,u^-	0	1	0	1	−1	11	1	1	15	62
		0,u^-	0	1	0	3	−1	9	1	1	15	25
10 373.1	1.176	2,*u*								2	16	<25
10 375.0	1.204	2,*g*								0	16	<25
10 375.4	1.191	1,*g*								1	16	<25
10 375.5	1.204	2,*u*								0	16	<25
10 376.0	1.159	0,g^+	0	4	0	2	2	2	−2	4	16	31
		0,g^+	0	4	0	2	0	2	0	4	16	66
10 376.1	1.163	1,*g*	1	1	1	2	2	1	−1	3	16	33
		1,*g*	1	1	1	2	0	1	1	3	16	38
10 376.8	1.178	0,g^-	0	1	1	5	−3	3	3	2	16	34
10 377.2	1.180	0,g^-	0	2	0	6	−2	4	2	2	16	32
10 377.7	1.190	1,*g*								1	16	<25
10 378.5	1.179	0,u^+	0	2	0	5	5	5	−5	2	16	32
10 379.0	1.177	2,*g*								2	16	<25
10 379.0	1.189	1,*u*								1	16	<25
10 379.6	1.207	1,*u*	0	0	0	0	0	15	1	0	15	48
10 379.7	1.177	2,*u*								2	16	<25
10 380.2	1.177	0,u^-	0	0	2	3	−3	3	3	2	16	46
10 380.3	1.190	1,*u*								1	16	<25
10 382.8	1.177	2,*g*								2	16	<25
10 384.0	1.196	2,*u*	0	1	0	1	1	11	1	1	15	32
		2,*u*	0	1	0	1	−1	11	3	1	15	31
10 384.1	1.189	1,*g*								1	16	<25
10 384.2	1.179	2,*g*								2	16	<25
10 384.2	1.159	2,*g*	0	4	0	2	2	2	0	4	16	36
		2,*g*	0	4	0	2	0	2	2	4	16	62
10 385.3	1.178	0,g^+								2	16	<25
10 385.6	1.191	1,*g*								1	16	<25
10 385.9	1.170	1,*u*	0	3	0	4	2	3	−1	3	16	30
		1,*u*	0	3	0	4	0	3	1	3	16	32
10 387.1	1.167	1,*u*	0	2	1	3	−1	2	2	3	16	30
10 387.1	1.178	0,u^+								2	16	<25
10 387.3	1.191	1,*u*								1	16	<25
10 388.1	1.178	2,*u*								2	16	<25
10 389.2	1.203	2,*g*								0	16	<25
10 389.4	1.168	1,*g*								3	16	<25
10 390.8	1.203	0,g^+								0	16	<25
10 390.9	1.203	0,u^+								0	16	<25
10 391.9	1.203	2,*u*	0	0	0	9	9	7	−7	0	16	36
10 392.2	1.175	0,g^-	1	0	1	3	−3	3	3	2	16	57
10 395.0	1.178	2,*g*								2	16	<25
10 396.4	1.174	0,u^+	2	0	0	5	1	1	−1	2	16	48
10 397.4	1.191	1,*u*								1	16	<25
10 397.7	1.174	2,*u*	2	0	0	5	3	1	−1	2	16	40
10 398.9	1.196	0,g^+	0	1	0	0	0	12	0	1	15	67
10 399.3	1.203	2,*u*	0	0	0	9	9	7	−7	0	16	33
10 400.3	1.191	1,*g*								1	16	<25
10 402.0	1.178	0,u^-	1	1	0	5	−3	3	3	2	16	34
10 402.1	1.167	1,*u*	0	2	1	3	1	2	0	3	16	38
		1,*u*	0	2	1	3	−1	2	2	3	16	38
10 403.7	1.177	0,g^+								2	16	<25
10 404.6	1.176	0,u^+								2	16	<25
10 405.2	1.176	2,*u*								2	16	<25
10 405.5	1.154	0,g^+	0	2	2	0	0	0	0	4	16	52
		0,g^+	0	3	1	1	1	1	−1	4	16	37
10 406.9	1.189	1,*u*								1	16	<25
10 407.4	1.202	2,*g*								0	16	<25
10 407.6	1.206	1,*u*								0	15	<25
10 408.2	1.206	1,*g*								0	15	<25
10 408.6	1.177	2,*g*								2	16	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 408.7	1.177	$0,u^-$	0	0	2	3	−1	3	1	2	16	34
10 409.4	1.164	$1,g$	2	1	0	3	1	0	0	3	16	44
10 411.4	1.165	$1,g$	2	1	0	3	1	0	0	3	16	34
10 411.5	1.178	$2,u$								2	16	<25
10 411.5	1.203	$0,u^-$								0	16	<25
10 411.7	1.196	$2,g$	0	1	0	0	0	12	2	1	15	68
10 412.5	1.203	$0,g^-$	0	0	0	12	−4	4	4	0	16	37
10 414.7	1.190	$1,u$								1	16	<25
10 414.7	1.159	$1,u$	2	0	1	1	1	0	0	3	16	65
		$1,u$	0	0	3	1	1	0	0	3	16	28
10 415.1	1.190	$1,g$	0	0	1	6	6	5	−5	1	16	25
10 416.5	1.202	$0,g^+$	0	0	0	14	2	2	−2	0	16	32
10 417.8	1.176	$0,g^+$	1	0	1	3	3	3	−3	2	16	50
10 418.9	1.178	$2,u$								2	16	<25
10 419.1	1.176	$2,g$								2	16	<25
10 420.0	1.203	$2,u$								0	16	<25
10 420.5	1.203	$0,u^+$								0	16	<25
10 420.8	1.191	$1,u$								1	16	<25
10 420.9	1.190	$1,g$								1	16	<25
10 421.3	1.173	$0,u^-$	2	0	0	5	−1	1	1	2	16	69
10 422.6	1.168	$1,g$	1	2	0	3	3	2	−2	3	16	30
10 425.1	1.178	$0,g^-$	0	1	1	5	−1	3	1	2	16	30
10 427.0	1.179	$0,g^+$								2	16	<25
10 428.9	1.190	$1,g$								1	16	<25
10 429.1	1.174	$2,u$	2	0	0	5	1	1	1	2	16	51
10 429.9	1.156	$0,g^-$	0	3	1	1	−1	1	1	4	16	95
10 430.5	1.179	$0,u^-$	0	2	0	5	−3	5	3	2	16	28
10 431.0	1.203	$2,g$								0	16	<25
10 431.3	1.167	$1,g$								3	16	<25
10 431.3	1.203	$0,u^-$	0	0	0	11	−5	5	5	0	16	43
10 432.0	1.204	$0,g^+$								0	16	<25
10 432.6	1.190	$1,g$								1	16	<25
10 432.9	1.154	$0,g^+$	0	2	2	0	0	0	0	4	16	39
		$0,g^+$	0	3	1	1	1	1	−1	4	16	53
10 433.5	1.179	$0,u^+$								2	16	<25
10 433.8	1.178	$2,g$								2	16	<25
10 435.3	1.178	$0,u^+$	1	1	0	5	3	3	−3	2	16	35
10 436.5	1.191	$1,u$	1	0	0	6	6	5	−5	1	16	35
10 437.7	1.178	$2,u$								2	16	<25
10 438.0	1.203	$2,u$								0	16	<25
10 438.2	1.204	$0,u^+$	0	0	0	9	7	7	−7	0	16	39
10 438.5	1.156	$2,g$	0	3	1	1	1	1	1	4	16	94
10 438.6	1.205	$0,g^-$								0	16	<25
10 439.8	1.204	$2,g$								0	16	<25
10 439.9	1.190	$1,g$								1	16	<25
10 440.2	1.204	$0,u^-$	0	0	0	9	−7	7	7	0	16	25
10 441.9	1.179	$2,g$								2	16	<25
10 442.1	1.190	$1,g$								1	16	<25
10 442.6	1.190	$1,u$								1	16	<25
10 443.7	1.179	$0,u^-$	0	1	1	4	−4	4	4	2	16	45
10 444.2	1.179	$2,u$	0	1	1	4	4	4	−2	2	16	25
10 444.2	1.204	$2,u$								0	16	<25
10 444.5	1.165	$1,g$	0	1	2	1	1	2	0	3	16	31
		$1,g$	0	1	2	1	−1	2	2	3	16	26
10 445.3	1.148	$1,u$	0	5	0	0	0	1	1	5	16	100
10 447.4	1.191	$1,u$								1	16	<25
10 448.0	1.207	$1,g$								0	15	<25
10 448.9	1.167	$1,g$								3	16	<25
10 449.1	1.178	$2,u$	1	1	0	5	3	3	−1	2	16	26
10 449.4	1.175	$0,g^+$	2	0	0	4	2	2	−2	2	16	27
10 449.6	1.175	$2,g$	2	0	0	4	4	2	−2	2	16	53
10 449.6	1.190	$1,u$								1	16	<25
10 449.9	1.152	$0,u^+$	1	2	1	0	0	0	0	4	16	80
10 451.1	1.181	$0,g^+$								2	16	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 452.4	1.178	$0,g^-$								2	16	<25
10 453.6	1.204	$2,g$								0	16	<25
10 455.7	1.204	$0,g^+$	0	0	0	8	8	8	−8	0	16	55
10 456.4	1.207	$1,u$	0	0	0	0	0	15	1	0	15	40
10 456.4	1.169	$1,g$								3	16	<25
10 458.6	1.180	$2,g$								2	16	<25
10 459.2	1.205	$0,g^-$	0	0	0	8	−8	8	8	0	16	66
10 459.9	1.192	$1,g$								1	16	<25
10 461.0	1.191	$1,u$								1	16	<25
10 461.4	1.178	$0,g^-$								2	16	<25
10 462.7	1.191	$1,u$								1	16	<25
10 463.2	1.177	$2,g$								2	16	<25
10 463.9	1.179	$0,u^+$	0	1	1	4	4	4	−4	2	16	28
10 464.1	1.191	$1,g$								1	16	<25
10 465.3	1.203	$2,u$								0	16	<25
10 465.7	1.165	$1,g$								3	16	<25
10 468.8	1.177	$0,u^+$								2	16	<25
10 469.0	1.164	$1,u$	1	1	1	1	1	2	0	3	16	35
		$1,u$	1	1	1	1	−1	2	2	3	16	27
10 470.6	1.176	$2,g$								2	16	<25
10 470.8	1.190	$1,g$								1	16	<25
10 471.3	1.178	$0,g^+$	1	1	0	4	4	4	−4	2	16	31
10 473.0	1.179	$2,u$								2	16	<25
10 474.2	1.191	$1,u$								1	16	<25
10 474.4	1.174	$0,g^-$	2	0	0	4	−2	2	2	2	16	57
10 474.7	1.181	$0,u^+$	0	2	0	5	3	5	−3	2	16	30
10 475.0	1.156	$0,u^+$	1	3	0	1	1	1	−1	4	16	53
		$0,u^+$	0	4	0	1	1	3	−1	4	16	26
10 475.1	1.191	$1,g$								1	16	<25
10 475.4	1.203	$2,g$								0	16	<25
10 477.3	1.178	$2,g$								2	16	<25
10 477.3	1.176	$0,g^+$	1	0	1	3	1	3	−1	2	16	25
10 478.0	1.178	$0,u^-$	1	1	0	5	−1	3	1	2	16	25
10 478.5	1.203	$0,u^+$	0	0	0	15	1	1	−1	0	16	34
10 479.5	1.180	$2,u$								2	16	<25
10 480.7	1.203	$2,u$								0	16	<25
10 480.7	1.204	$0,g^+$								0	16	<25
10 485.2	1.176	$2,u$								2	16	<25
10 486.2	1.178	$0,g^-$	1	1	0	4	−4	4	4	2	16	35
10 486.8	1.204	$2,g$								0	16	<25
10 486.8	1.155	$0,u^-$	1	3	0	1	−1	1	1	4	16	92
10 487.2	1.191	$1,u$								1	16	<25
10 489.7	1.179	$2,g$								2	16	<25
10 490.3	1.179	$2,u$								2	16	<25
10 490.4	1.156	$2,u$	1	3	0	1	1	1	1	4	16	71
10 490.6	1.167	$1,g$	0	2	1	2	2	3	−1	3	16	30
10 490.9	1.179	$0,g^+$	1	1	0	4	4	4	−4	2	16	33
10 492.7	1.191	$1,g$								1	16	<25
10 494.8	1.178	$0,u^-$	1	1	0	5	−1	3	1	2	16	33
10 494.9	1.164	$1,u$	1	1	1	1	−1	2	2	3	16	49
10 494.9	1.204	$0,u^-$								0	16	<25
10 495.6	1.204	$0,g^-$								0	16	<25
10 496.7	1.158	$0,u^+$	1	3	0	1	1	1	−1	4	16	29
		$0,u^+$	0	4	0	1	1	3	−1	4	16	68
10 496.9	1.175	$2,g$								2	16	<25
10 497.1	1.190	$1,u$								1	16	<25
10 497.3	1.177	$0,g^-$	0	0	2	2	−2	4	2	2	16	34
10 497.4	1.204	$2,u$								0	16	<25
10 499.9	1.177	$2,g$								2	16	<25
10 501.1	1.191	$1,u$								1	16	<25
10 502.5	1.171	$1,g$	0	3	0	3	1	4	0	3	16	44
		$1,g$	0	3	0	3	−1	4	2	3	16	31
10 502.5	1.203	$2,g$								0	16	<25
10 502.6	1.167	$1,g$	0	2	1	2	2	3	−1	3	16	29

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		1,*g*	0	2	1	2	−2	3	3	3	16	41
10 503.4	1.178	2,*u*								2	16	<25
10 504.5	1.205	0,u^+								0	16	<25
10 505.0	1.191	1,*u*								1	16	<25
10 506.7	1.177	0,g^+								2	16	<25
10 507.0	1.203	2,*g*	0	0	0	16	2	0	0	0	16	27
10 507.3	1.191	1,*g*								1	16	<25
10 507.3	1.202	0,g^+	0	0	0	16	0	0	0	0	16	36
10 508.3	1.176	0,u^-	1	0	1	2	−2	4	2	2	16	58
10 508.7	1.179	2,*g*	0	2	0	4	−4	6	6	2	16	30
10 509.7	1.204	0,g^+								0	16	<25
10 509.8	1.159	2,*u*	0	4	0	1	−1	3	3	4	16	52
10 510.8	1.191	1,*u*	0	1	0	6	−6	7	7	1	16	26
10 511.9	1.163	1,*u*	2	1	0	2	2	1	−1	3	16	54
10 512.6	1.175	0,g^+	2	0	0	4	0	2	0	2	16	37
10 514.3	1.191	1,*g*								1	16	<25
10 514.7	1.205	0,u^+								0	16	<25
10 515.5	1.168	1,*u*								3	16	<25
10 515.8	1.191	1,*u*								1	16	<25
10 516.2	1.205	2,*u*								0	16	<25
10 517.6	1.191	1,*g*								1	16	<25
10 519.0	1.168	1,*g*	0	2	1	2	0	3	1	3	16	51
10 519.4	1.179	2,*g*								2	16	<25
10 521.0	1.160	0,u^-	0	4	0	1	−1	3	1	4	16	93
10 521.3	1.179	0,u^+								2	16	<25
10 521.7	1.205	2,*g*								0	16	<25
10 522.2	1.176	2,*u*	1	0	1	2	−2	4	4	2	16	38
10 522.5	1.174	2,*g*	2	0	0	4	0	2	2	2	16	39
10 524.2	1.180	0,g^+								2	16	<25
10 526.6	1.204	2,*u*								0	16	<25
10 526.7	1.192	1,*g*								1	16	<25
10 527.1	1.162	1,*u*	2	1	0	2	0	1	1	3	16	68
10 528.1	1.179	0,g^-	1	1	0	4	−2	4	2	2	16	45
10 529.2	1.180	0,g^+	0	1	1	3	1	5	−1	2	16	30
10 529.5	1.204	0,g^-								0	16	<25
10 531.2	1.160	2,*u*	0	4	0	1	1	3	1	4	16	60
		2,*u*	0	4	0	1	−1	3	3	4	16	36
10 531.4	1.179	0,u^+								2	16	<25
10 531.9	1.179	2,*u*								2	16	<25
10 532.3	1.203	0,u^-	0	0	0	15	−1	1	1	0	16	32
10 533.0	1.160	1,*g*	2	0	1	0	0	1	1	3	16	61
		1,*g*	0	0	3	0	0	1	1	3	16	28
10 533.2	1.178	2,*g*								2	16	<25
10 535.2	1.203	2,*g*								0	16	<25
10 536.6	1.176	0,u^+	2	0	0	3	3	3	−3	2	16	32
10 537.8	1.192	1,*g*								1	16	<25
10 539.1	1.191	1,*u*								1	16	<25
10 539.8	1.180	2,*g*								2	16	<25
10 542.0	1.203	2,*u*	0	0	0	15	1	1	1	0	16	27
10 542.8	1.192	1,*u*								1	16	<25
10 543.4	1.167	1,*u*	1	2	0	2	2	3	−1	3	16	31
		1,*u*	1	2	0	2	−2	3	3	3	16	37
10 544.7	1.192	1,*g*								1	16	<25
10 545.0	1.204	0,u^-	0	0	0	7	−7	9	7	0	16	38
10 545.6	1.179	2,*g*								2	16	<25
10 546.7	1.192	1,*g*								1	16	<25
10 547.0	1.182	0,u^-	0	2	0	5	−1	5	1	2	16	38
10 547.1	1.180	2,*u*								2	16	<25
10 547.4	1.169	1,*u*								3	16	<25
10 548.1	1.205	0,g^+								0	16	<25
10 549.3	1.174	0,u^-	2	0	0	3	−3	3	3	2	16	69
10 549.7	1.192	1,*u*								1	16	<25
10 551.7	1.180	0,g^-	0	1	1	3	−3	5	3	2	16	53
10 553.0	1.205	2,*u*								0	16	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 553.1	1.192	1,*u*								1	16	<25
10 553.6	1.176	2,*u*	2	0	0	3	3	3	−1	2	16	28
10 554.0	1.176	0,u^+	1	0	1	2	2	4	−2	2	16	37
10 556.0	1.181	2,*u*								2	16	<25
10 556.0	1.205	0,u^+								0	16	<25
10 561.5	1.205	2,*g*								0	16	<25
10 563.2	1.191	1,*g*								1	16	<25
10 563.8	1.176	2,*u*								2	16	<25
10 565.8	1.180	2,*g*	0	1	1	3	−3	5	5	2	16	29
10 565.9	1.205	2,*u*								0	16	<25
10 566.1	1.176	0,u^+	2	0	0	3	3	3	−3	2	16	37
		0,u^+	0	0	2	1	1	5	−1	2	16	28
10 568.2	1.158	1,*g*	3	0	0	1	1	0	0	3	16	84
10 569.4	1.168	1,*u*	1	2	0	2	0	3	1	3	16	29
10 570.5	1.182	0,g^-	0	2	0	4	−2	6	2	2	16	35
10 572.2	1.206	1,*g*								0	15	<25
10 572.2	1.179	0,g^+								2	16	<25
10 572.4	1.206	1,*u*								0	15	<25
10 572.5	1.190	1,*g*								1	16	<25
10 572.7	1.192	1,*u*								1	16	<25
10 574.9	1.170	1,*u*	0	3	0	2	−2	5	3	3	16	40
10 575.1	1.157	0,u^+	0	3	1	0	0	2	0	4	16	95
10 575.9	1.205	0,g^+	0	0	0	6	6	10	−6	0	16	27
10 576.0	1.181	2,*g*								2	16	<25
10 576.4	1.180	0,u^-	1	1	0	3	−3	5	3	2	16	45
10 577.3	1.206	0,g^-	0	0	0	6	−2	10	2	0	16	25
10 577.8	1.192	1,*g*								1	16	<25
10 578.1	1.206	0,u^-								0	16	<25
10 578.9	1.180	0,u^+	1	1	0	3	1	5	−1	2	16	26
10 580.0	1.175	2,*u*	2	0	0	3	3	3	−1	2	16	33
10 581.0	1.166	1,*u*	0	1	2	0	0	3	1	3	16	48
10 581.3	1.205	2,*g*								0	16	<25
10 583.4	1.192	1,*g*								1	16	<25
10 584.3	1.204	0,u^+								0	16	<25
10 584.8	1.178	0,g^+	1	0	1	1	1	5	−1	2	16	32
10 585.9	1.177	0,u^+	1	0	1	2	0	4	0	2	16	30
		0,u^+	0	0	2	1	1	5	−1	2	16	28
10 586.1	1.205	2,*u*								0	16	<25
10 586.8	1.180	2,*g*								2	16	<25
10 588.4	1.190	1,*u*								1	16	<25
10 589.2	1.178	0,g^+								2	16	<25
10 589.3	1.157	2,*u*	0	3	1	0	0	2	2	4	16	94
10 591.0	1.179	2,*u*								2	16	<25
10 592.9	1.205	2,*g*								0	16	<25
10 593.1	1.179	2,*u*								2	16	<25
10 593.1	1.192	1,*g*								1	16	<25
10 594.8	1.205	2,*u*								0	16	<25
10 595.8	1.179	2,*g*								2	16	<25
10 597.3	1.151	0,g^+	2	2	0	0	0	0	0	4	16	86
10 598.5	1.179	2,*u*								2	16	<25
10 599.0	1.203	0,g^+								0	16	<25
10 601.5	1.193	1,*u*								1	16	<25
10 601.9	1.203	2,*g*								0	16	<25
10 602.7	1.176	0,u^-	2	0	0	3	−1	3	1	2	16	37
		0,u^-	0	0	2	1	−1	5	1	2	16	34
10 603.0	1.177	2,*g*	1	0	1	1	1	5	1	2	16	26
10 606.1	1.164	1,*g*	1	1	1	0	0	3	1	3	16	52
10 606.4	1.191	1,*g*								1	16	<25
10 606.9	1.192	1,*u*								1	16	<25
10 607.5	1.177	0,u^-	2	0	0	3	−1	3	1	2	16	35
10 607.7	1.193	1,*u*								1	16	<25
10 616.4	1.168	1,*u*	0	2	1	1	1	4	0	3	16	40
		1,*u*	0	2	1	1	−1	4	2	3	16	29
10 616.4	1.174	2,*u*	2	0	0	3	1	3	1	2	16	43

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 616.6	1.180	$0,g^-$	0	1	1	3	−1	5	1	2	16	42
10 617.5	1.181	$0,u^-$	0	0	2	1	−1	5	1	2	16	28
		$0,u^-$	0	2	0	3	−3	7	3	2	16	38
10 618.5	1.179	2,u								2	16	<25
10 618.9	1.205	$0,g^-$	0	0	0	6	−4	10	4	0	16	25
10 619.6	1.179	$0,u^+$	1	1	0	3	3	5	−3	2	16	46
10 620.2	1.172	1,u	0	3	0	2	2	5	−1	3	16	26
		1,u	0	3	0	2	0	5	1	3	16	48
10 623.3	1.193	1,g								1	16	<25
10 623.7	1.205	$0,u^-$								0	16	<25
10 624.9	1.207	$0,u^+$								0	16	<25
10 627.8	1.180	2,g								2	16	<25
10 627.9	1.179	2,u								2	16	<25
10 628.4	1.205	2,u								0	16	<25
10 628.6	1.192	1,u								1	16	<25
10 629.3	1.193	1,g								1	16	<25
10 630.0	1.205	2,g								0	16	<25
10 631.8	1.156	$0,g^+$	1	3	0	0	0	2	0	4	16	79
10 633.1	1.180	$0,u^+$	0	1	1	2	2	6	−2	2	16	39
10 634.4	1.180	2,u	1	1	0	3	3	5	−1	2	16	26
10 635.8	1.169	1,u	0	2	1	1	1	4	0	3	16	39
		1,u	0	2	1	1	−1	4	2	3	16	47
10 637.5	1.193	1,u								1	16	<25
10 637.6	1.163	1,g	2	1	0	1	−1	2	2	3	16	47
		1,g	1	1	1	0	0	3	1	3	16	32
10 638.3	1.207	$0,g^+$								0	16	<25
10 640.6	1.176	$0,g^-$	1	0	1	1	−1	5	1	2	16	49
10 642.3	1.207	2,u								0	16	<25
10 642.8	1.183	$0,g^+$	0	2	0	4	2	6	−2	2	16	28
10 643.4	1.205	$0,g^-$	0	0	0	6	−6	10	6	0	16	32
10 643.8	1.163	1,g	2	1	0	1	1	2	0	3	16	54
		1,g	2	1	0	1	−1	2	2	3	16	29
10 644.3	1.175	$0,g^+$	2	0	0	2	2	4	−2	2	16	42
		$0,g^+$	2	0	0	2	0	4	0	2	16	26
10 645.1	1.156	2,g	1	3	0	0	0	2	2	4	16	87
10 647.4	1.193	1,g								1	16	<25
10 647.7	1.180	2,u	0	1	1	2	2	6	0	2	16	25
10 648.4	1.205	2,g								0	16	<25
10 650.3	1.190	1,u								1	16	<25
10 651.2	1.193	1,g								1	16	<25
10 651.4	1.181	$0,g^+$								2	16	<25
10 651.5	1.180	2,g								2	16	<25
10 653.4	1.193	1,u								1	16	<25
10 653.6	1.169	1,g	1	2	0	1	1	4	0	3	16	26
10 654.1	1.180	2,g								2	16	<25
10 654.9	1.206	2,g								0	16	<25
10 657.3	1.206	$0,u^+$								0	16	<25
10 658.1	1.204	$0,u^-$								0	16	<25
10 660.1	1.175	2,g	2	0	0	2	2	4	0	2	16	25
10 660.9	1.191	1,g								1	16	<25
10 662.3	1.204	2,u								0	16	<25
10 663.8	1.181	$0,u^-$	0	1	1	2	−2	6	2	2	16	51
10 664.1	1.183	$0,u^+$	0	2	0	3	3	7	−3	2	16	43
10 666.5	1.181	2,g								2	16	<25
10 666.9	1.191	1,u								1	16	<25
10 668.5	1.206	2,u								0	16	<25
10 668.8	1.160	$0,g^+$	0	4	0	0	0	4	0	4	16	84
10 670.6	1.175	$0,g^-$	2	0	0	2	−2	4	2	2	16	61
		$0,g^-$	1	0	1	1	−1	5	1	2	16	30
10 670.7	1.182	2,u								2	16	<25
10 671.0	1.192	1,u								1	16	<25
10 677.4	1.179	$0,u^-$	1	1	0	3	−1	5	1	2	16	54
10 677.9	1.206	$0,g^+$								0	16	<25
10 679.5	1.193	1,g								1	16	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 680.8	1.181	2,*u*								2	16	<25
10 681.2	1.160	2,*g*	0	4	0	0	0	4	2	4	16	88
10 681.6	1.175	2,*g*	2	0	0	2	−2	4	4	2	16	43
10 685.6	1.206	2,*g*								0	16	<25
10 687.5	1.180	2,*u*								2	16	<25
10 690.4	1.169	1,*g*	1	2	0	1	−1	4	2	3	16	60
10 690.6	1.193	1,*u*								1	16	<25
10 691.1	1.158	1,*u*	3	0	0	0	0	1	1	3	16	91
10 691.9	1.170	1,*g*	1	2	0	1	1	4	0	3	16	47
		1,*g*	0	3	0	1	−1	6	2	3	16	36
10 693.9	1.179	$0,g^+$	0	0	2	0	0	6	0	2	16	44
10 694.2	1.168	$0,g^+$	0	3	0	8	0	0	0	3	17	80
10 698.0	1.169	2,*g*	0	3	0	8	2	0	0	3	17	81
10 699.5	1.177	$0,g^+$	2	0	0	2	0	4	0	2	16	37
10 700.3	1.159	1,*g*	0	4	0	5	1	0	0	4	17	96
10 701.2	1.205	$0,u^+$								0	16	<25
10 701.4	1.194	1,*g*								1	16	<25
10 701.8	1.179	$0,g^+$	0	0	2	0	0	6	0	2	16	27
10 703.8	1.194	1,*u*								1	16	<25
10 705.6	1.207	$0,u^-$								0	16	<25
10 707.1	1.205	2,*u*								0	16	<25
10 707.7	1.180	$0,g^-$	1	1	0	2	−2	6	2	2	16	70
10 708.4	1.181	$0,u^+$	0	1	1	2	0	6	0	2	16	28
10 709.1	1.179	2,*g*	0	0	2	0	0	6	2	2	16	35
10 709.5	1.194	1,*g*								1	16	<25
10 711.7	1.176	2,*g*	2	0	0	2	0	4	2	2	16	48
10 712.4	1.207	$0,g^-$	0	0	0	4	−2	12	2	0	16	30
10 715.7	1.181	2,*g*	0	0	2	0	0	6	2	2	16	31
10 718.4	1.207	2,*u*								0	16	<25
10 719.9	1.206	$0,g^+$								0	16	<25
10 720.3	1.207	2,*g*								0	16	<25
10 720.6	1.181	2,*u*	0	1	1	2	0	6	2	2	16	30
10 720.7	1.178	$0,u^+$	1	0	1	0	0	6	0	2	16	45
10 720.9	1.180	2,*g*	1	1	0	2	2	6	0	2	16	35
		2,*g*	1	1	0	2	−2	6	4	2	16	33
10 722.2	1.176	1,*g*								2	17	<25
10 723.1	1.176	1,*u*								2	17	<25
10 724.2	1.192	1,*g*	1	0	0	3	−3	8	4	1	16	26
10 724.5	1.205	$0,g^+$								0	16	<25
10 727.8	1.191	1,*g*								1	16	<25
10 727.9	1.193	1,*u*								1	16	<25
10 728.5	1.169	$0,u^+$	0	3	0	7	1	1	−1	3	17	62
10 728.9	1.205	2,*g*								0	16	<25
10 731.6	1.192	1,*u*								1	16	<25
10 731.9	1.169	2,*u*	0	3	0	7	3	1	−1	3	17	45
10 734.5	1.178	2,*u*	1	0	1	0	0	6	2	2	16	50
10 735.0	1.194	1,*g*	0	0	1	2	0	9	1	1	16	25
10 737.0	1.184	$0,u^-$	0	2	0	3	−1	7	1	2	16	50
10 737.1	1.172	1,*g*	0	3	0	1	1	6	0	3	16	48
		1,*g*	0	3	0	1	−1	6	2	3	16	37
10 739.1	1.207	2,*g*								0	16	<25
10 740.6	1.206	$0,u^-$	0	0	0	5	−5	11	5	0	16	35
10 745.0	1.182	$0,g^+$	0	1	1	1	1	7	−1	2	16	69
10 747.5	1.193	1,*g*								1	16	<25
10 747.8	1.184	2,*u*	0	2	0	3	1	7	1	2	16	26
10 748.1	1.194	1,*u*								1	16	<25
10 748.9	1.206	2,*u*								0	16	<25
10 749.5	1.170	1,*g*	0	2	1	0	0	5	1	3	16	88
10 751.2	1.208	$0,u^+$	0	0	0	3	1	13	−1	0	16	44
10 752.8	1.183	$0,g^-$	0	2	0	2	−2	8	2	2	16	65
10 757.9	1.182	2,*g*	0	1	1	1	−1	7	3	2	16	40
10 760.4	1.164	1,*u*	2	1	0	0	0	3	1	3	16	78
10 760.5	1.193	1,*u*								1	16	<25
10 761.4	1.176	$0,u^+$	2	0	0	1	1	5	−1	2	16	58

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,u^+$	1	0	1	0	0	6	0	2	16	34
10 763.1	1.206	$0,g^-$	0	0	0	4	−4	12	4	0	16	29
10 766.4	1.183	$2,g$	0	2	0	2	−2	8	4	2	16	35
10 766.6	1.180	$0,g^+$	1	1	0	2	2	6	−2	2	16	31
		$0,g^+$	1	1	0	2	0	6	0	2	16	45
10 768.1	1.208	$2,u$	0	0	0	3	−1	13	3	0	16	27
10 769.7	1.206	$2,g$								0	16	<25
10 771.6	1.177	$1,g$	0	2	0	11	1	0	0	2	17	35
10 772.6	1.194	$1,g$								1	16	<25
10 775.7	1.176	$2,u$	2	0	0	1	−1	5	3	2	16	36
		$2,u$	1	0	1	0	0	6	2	2	16	32
10 777.3	1.167	$0,g^+$								3	17	<25
10 777.4	1.180	$2,g$	1	1	0	2	0	6	2	2	16	43
10 779.5	1.178	$1,u$								2	17	<25
10 779.6	1.190	$0,u^+$								1	17	<25
10 779.6	1.190	$0,g^+$								1	17	<25
10 781.8	1.194	$1,u$								1	16	<25
10 781.9	1.167	$2,g$								3	17	<25
10 782.4	1.181	$0,u^+$	1	1	0	1	1	7	−1	2	16	52
10 783.3	1.170	$0,u^-$	0	3	0	7	−1	1	1	3	17	84
10 785.3	1.165	$0,u^+$	0	2	1	6	0	0	0	3	17	26
10 785.9	1.190	$2,g$								1	17	<25
10 785.9	1.190	$2,u$								1	17	<25
10 785.9	1.168	$2,u$	0	3	0	7	3	1	−1	3	17	42
10 786.2	1.178	$1,g$								2	17	<25
10 789.7	1.159	$1,u$	0	4	0	4	2	1	−1	4	17	59
		$1,u$	0	4	0	4	0	1	1	4	17	31
10 789.7	1.205	$0,u^-$								0	16	<25
10 789.9	1.207	$0,g^+$	0	0	0	4	4	12	−4	0	16	30
10 790.3	1.176	$0,u^-$	2	0	0	1	−1	5	1	2	16	83
10 792.5	1.166	$2,u$	0	3	0	7	1	1	1	3	17	42
10 792.9	1.177	$1,u$								2	17	<25
10 795.0	1.192	$1,g$								1	16	<25
10 795.6	1.205	$2,u$								0	16	<25
10 795.8	1.182	$0,g^-$	0	1	1	1	−1	7	1	2	16	76
10 796.8	1.181	$2,u$	1	1	0	1	1	7	1	2	16	27
		$2,u$	1	1	0	1	−1	7	3	2	16	25
10 800.0	1.164	$0,u^+$	0	0	3	2	0	0	0	3	17	35
		$0,u^+$	0	2	1	6	0	0	0	3	17	31
10 800.6	1.165	$0,g^+$	1	0	2	2	0	0	0	3	17	37
10 801.1	1.207	$2,g$								0	16	<25
10 802.8	1.191	$1,u$								1	16	<25
10 803.1	1.176	$2,u$	2	0	0	1	1	5	1	2	16	47
		$2,u$	2	0	0	1	−1	5	3	2	16	35
10 803.7	1.163	$2,u$	0	0	3	2	2	0	0	3	17	40
		$2,u$	0	2	1	6	2	0	0	3	17	26
10 804.4	1.165	$2,g$	1	0	2	2	2	0	0	3	17	37
10 804.5	1.169	$1,u$	1	2	0	0	0	5	1	3	16	66
10 806.7	1.195	$1,g$								1	16	<25
10 808.0	1.178	$1,u$								2	17	<25
10 808.5	1.182	$2,g$	0	1	1	1	1	7	1	2	16	35
		$2,g$	0	1	1	1	−1	7	3	2	16	38
10 809.0	1.194	$1,g$								1	16	<25
10 809.8	1.178	$1,g$								2	17	<25
10 814.5	1.195	$1,u$								1	16	<25
10 818.2	1.177	$1,g$								2	17	<25
10 818.6	1.194	$1,u$								1	16	<25
10 819.4	1.207	$0,u^+$	0	0	0	3	3	13	−3	0	16	38
10 823.0	1.148	$0,g^+$	0	5	0	2	0	0	0	5	17	100
10 824.4	1.160	$1,u$	0	4	0	4	2	1	−1	4	17	34
		$1,u$	0	4	0	4	0	1	1	4	17	63
10 825.5	1.207	$2,u$	0	0	0	3	3	13	−1	0	16	26
10 826.1	1.148	$2,g$	0	5	0	2	2	0	0	5	17	100
10 826.4	1.164	$0,g^+$	1	0	2	2	0	0	0	3	17	32

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 826.7	1.165	2,*g*	1	0	2	2	2	0	0	3	17	34
10 826.8	1.184	0,g^+	0	2	0	2	2	8	−2	2	16	34
		0,g^+	0	2	0	2	0	8	0	2	16	37
10 827.7	1.170	0,g^-	0	3	0	6	−2	2	2	3	17	71
10 828.1	1.207	0,g^-								0	16	<25
10 831.8	1.184	0,u^+	1	1	0	1	1	7	−1	2	16	31
		0,u^+	0	2	0	1	1	9	−1	2	16	60
10 834.7	1.169	2,*g*	0	3	0	6	0	2	2	3	17	34
10 835.1	1.207	0,u^+	0	0	0	5	5	11	−5	0	16	27
10 836.7	1.179	1,*u*	0	2	0	10	2	1	−1	2	17	30
10 838.3	1.184	2,*g*	0	2	0	2	0	8	2	2	16	37
10 838.9	1.207	2,*g*								0	16	<25
10 839.0	1.178	1,*u*	0	2	0	10	0	1	1	2	17	30
10 842.5	1.195	1,*u*	0	0	1	1	1	10	0	1	16	25
		1,*u*	0	0	1	1	−1	10	2	1	16	28
10 844.3	1.207	2,*u*								0	16	<25
10 845.5	1.184	2,*u*	0	2	0	1	1	9	1	2	16	29
		2,*u*	0	2	0	1	−1	9	3	2	16	31
10 845.7	1.195	1,*g*								1	16	<25
10 846.4	1.191	0,u^-								1	17	<25
10 846.4	1.191	0,g^-								1	17	<25
10 847.5	1.207	0,u^-	0	0	0	3	−3	13	3	0	16	35
10 848.3	1.166	0,u^+								3	17	<25
10 850.0	1.190	2,*u*								1	17	<25
10 850.2	1.191	2,*g*								1	17	<25
10 850.7	1.178	1,*g*								2	17	<25
10 851.4	1.173	1,*u*	0	3	0	0	0	7	1	3	16	78
10 851.4	1.190	0,u^+								1	17	<25
10 851.7	1.190	0,g^+								1	17	<25
10 851.8	1.181	0,u^-	1	1	0	1	−1	7	1	2	16	79
10 852.0	1.167	2,*u*								3	17	<25
10 852.8	1.177	1,*u*	1	0	1	7	1	0	0	2	17	28
		1,*u*	0	1	1	9	1	0	0	2	17	32
10 853.8	1.193	1,*u*	1	0	0	2	2	9	−1	1	16	34
		1,*u*	1	0	0	2	−2	9	3	1	16	29
10 855.1	1.206	0,g^+								0	16	<25
10 856.5	1.178	1,*g*								2	17	<25
10 857.6	1.165	0,g^+	0	1	2	4	0	0	0	3	17	28
		0,g^+	1	2	0	6	0	0	0	3	17	57
10 858.7	1.190	2,*g*								1	17	<25
10 858.8	1.190	2,*u*								1	17	<25
10 859.2	1.165	2,*g*	0	1	2	4	2	0	0	3	17	25
		2,*g*	1	2	0	6	2	0	0	3	17	60
10 861.3	1.206	2,*g*								0	16	<25
10 863.3	1.207	2,*u*	0	0	0	3	−3	13	5	0	16	31
10 863.8	1.181	2,*u*	1	1	0	1	1	7	1	2	16	40
		2,*u*	1	1	0	1	−1	7	3	2	16	38
10 865.8	1.179	1,*u*								2	17	<25
10 868.0	1.209	0,g^+	0	0	0	2	0	14	0	0	16	31
10 869.2	1.168	2,*u*	1	1	1	4	2	0	0	3	17	32
		2,*u*	0	3	0	5	5	3	−3	3	17	32
10 870.1	1.167	0,u^+	1	1	1	4	0	0	0	3	17	37
10 870.2	1.183	0,u^+	0	1	1	0	0	8	0	2	16	82
10 870.3	1.157	1,*u*	0	3	1	3	1	0	0	4	17	90
10 870.7	1.179	1,*g*								2	17	<25
10 872.6	1.177	0,g^+	2	0	0	0	0	6	0	2	16	79
10 873.6	1.192	1,*g*								1	16	<25
10 874.8	1.206	1,*u*								0	17	<25
10 874.8	1.206	1,*g*								0	17	<25
10 877.8	1.178	1,*g*								2	17	<25
10 878.3	1.167	2,*g*	0	2	1	5	3	1	−1	3	17	58
10 878.5	1.177	1,*u*								2	17	<25
10 879.0	1.208	2,*g*	0	0	0	2	0	14	2	0	16	30
10 879.1	1.167	0,g^+	0	2	1	5	1	1	−1	3	17	52

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 880.6	1.195	1,u								1	16	<25
10 881.6	1.194	1,g								1	16	<25
10 883.1	1.207	0,g^-	0	0	0	2	−2	14	2	0	16	32
10 883.7	1.170	0,g^+	0	3	0	6	2	2	−2	3	17	28
		0,g^+	0	3	0	6	0	2	0	3	17	51
10 884.2	1.183	2,u	0	1	1	0	0	8	2	2	16	80
10 884.5	1.177	1,g								2	17	<25
10 886.8	1.177	2,g	2	0	0	0	0	6	2	2	16	80
10 887.5	1.194	1,g	1	0	0	1	−1	10	2	1	16	27
10 887.7	1.169	0,u^-	0	2	1	4	−2	2	2	3	17	25
		0,u^-	0	3	0	5	−3	3	3	3	17	43
10 888.9	1.170	2,g	0	3	0	6	2	2	0	3	17	47
10 889.2	1.178	1,u								2	17	<25
10 890.6	1.168	0,g^-	0	2	1	5	−1	1	1	3	17	63
10 891.9	1.192	0,u^+	0	1	0	11	1	3	−1	1	17	26
10 891.9	1.192	0,g^+								1	17	<25
10 893.0	1.169	2,u								3	17	<25
10 895.7	1.192	2,u								1	17	<25
10 895.8	1.192	2,g								1	17	<25
10 896.0	1.160	1,g	0	4	0	3	3	2	−2	4	17	44
		1,g	0	4	0	3	1	2	0	4	17	26
10 896.4	1.207	2,g	0	0	0	2	−2	14	4	0	16	31
10 897.7	1.179	1,g								2	17	<25
10 899.4	1.168	2,g	0	2	1	5	1	1	1	3	17	48
		2,g	0	3	0	6	0	2	2	3	17	27
10 901.4	1.178	1,g								2	17	<25
10 901.5	1.179	1,u								2	17	<25
10 902.4	1.190	2,u								1	17	<25
10 902.6	1.190	0,u^+	0	0	1	12	0	0	0	1	17	28
10 902.9	1.190	2,g								1	17	<25
10 905.2	1.190	0,g^+	1	0	0	12	0	0	0	1	17	25
10 905.2	1.166	0,u^+								3	17	<25
10 906.2	1.167	2,u	0	1	2	3	3	1	−1	3	17	39
10 906.2	1.191	0,g^-								1	17	<25
10 907.4	1.177	1,u								2	17	<25
10 907.6	1.163	0,g^+	0	0	3	1	1	1	−1	3	17	40
10 908.3	1.191	0,u^-								1	17	<25
10 909.9	1.185	0,u^-	0	2	0	1	−1	9	1	2	16	80
10 911.1	1.179	1,g								2	17	<25
10 911.3	1.195	1,u								1	16	<25
10 913.5	1.191	2,u								1	17	<25
10 914.4	1.190	2,g								1	17	<25
10 916.4	1.166	0,u^-	0	1	2	3	−1	1	1	3	17	33
10 918.0	1.162	0,g^-	2	0	1	1	−1	1	1	3	17	30
		0,g^-	0	0	3	1	−1	1	1	3	17	60
10 919.1	1.159	1,g	1	3	0	3	1	0	0	4	17	27
		1,g	0	4	0	3	3	2	−2	4	17	40
10 920.3	1.165	0,u^+	1	0	2	1	1	1	−1	3	17	32
		0,u^+	1	2	0	5	1	1	−1	3	17	42
10 920.4	1.207	0,u^-								0	16	<25
10 921.6	1.178	1,u	0	1	1	7	3	2	−2	2	17	30
10 922.2	1.185	2,u	0	2	0	1	1	9	1	2	16	40
		2,u	0	2	0	1	−1	9	3	2	16	40
10 922.3	1.166	2,u	0	1	2	3	1	1	1	3	17	29
10 922.6	1.178	1,g								2	17	<25
10 922.7	1.191	0,u^+								1	17	<25
10 922.7	1.191	0,g^+								1	17	<25
10 924.6	1.163	2,g	0	0	3	1	1	1	1	3	17	37
10 924.9	1.167	2,u	1	2	0	5	3	1	−1	3	17	34
10 925.2	1.207	2,u								0	16	<25
10 925.3	1.209	0,u^+	0	0	0	1	1	15	−1	0	16	48
10 925.5	1.182	0,g^+	1	1	0	0	0	8	0	2	16	67
10 926.6	1.157	1,g	1	3	0	3	1	0	0	4	17	54
		1,g	0	4	0	3	−1	2	2	4	17	29

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 928.6	1.179	1,*u*								2	17	<25
10 928.8	1.190	2,*u*	0	0	1	12	2	0	0	1	17	29
10 929.2	1.164	0,u^+	1	0	2	1	1	1	−1	3	17	32
		0,u^+	0	1	2	3	1	1	−1	3	17	25
10 930.0	1.180	1,*u*								2	17	<25
10 930.3	1.178	1,*g*								2	17	<25
10 930.6	1.190	0,g^+	0	0	1	11	1	1	−1	1	17	39
10 931.0	1.191	2,*g*	0	0	1	11	3	1	−1	1	17	25
10 931.4	1.191	2,*u*								1	17	<25
10 931.4	1.191	2,*g*								1	17	<25
10 931.7	1.165	0,g^+	1	1	1	3	1	1	−1	3	17	31
10 932.1	1.190	0,u^+								1	17	<25
10 932.2	1.206	1,*u*								0	17	<25
10 932.2	1.206	1,*g*								0	17	<25
10 932.9	1.179	1,*g*								2	17	<25
10 934.4	1.171	0,u^+	0	3	0	5	3	3	−3	3	17	43
		0,u^+	0	3	0	5	1	3	−1	3	17	29
10 936.2	1.164	2,*g*	1	1	1	3	3	1	−1	3	17	43
10 936.4	1.194	1,*u*								1	16	<25
10 939.0	1.167	2,*u*	1	0	2	1	1	1	1	3	17	26
10 939.2	1.182	2,*g*	1	1	0	0	0	8	2	2	16	68
10 939.2	1.191	0,u^-	0	0	1	10	−2	2	2	1	17	25
10 939.4	1.164	0,u^-	1	0	2	1	−1	1	1	3	17	60
10 939.5	1.208	2,*u*	0	0	0	1	−1	15	3	0	16	32
10 939.7	1.196	1,*g*	0	1	0	1	1	12	0	1	16	27
10 941.4	1.194	1,*u*								1	16	<25
10 942.6	1.192	0,g^-	0	1	0	10	−2	4	2	1	17	27
10 944.2	1.191	2,*u*								1	17	<25
10 945.2	1.192	2,*g*	0	0	1	7	7	5	−5	1	17	27
10 945.4	1.167	2,*u*	1	0	2	1	1	1	1	3	17	27
10 945.5	1.178	1,*u*								2	17	<25
10 947.0	1.191	2,*g*								1	17	<25
10 947.1	1.192	0,u^-	0	1	0	11	−3	3	3	1	17	34
10 949.0	1.179	1,*u*								2	17	<25
10 949.5	1.191	0,g^+								1	17	<25
10 949.7	1.196	1,*g*	0	1	0	1	−1	12	2	1	16	26
10 951.7	1.179	1,*g*								2	17	<25
10 952.9	1.191	2,*u*								1	17	<25
10 954.1	1.178	1,*g*								2	17	<25
10 955.8	1.191	0,g^-	0	0	1	9	−3	3	3	1	17	29
10 956.3	1.160	1,*g*	0	4	0	3	1	2	0	4	17	57
		1,*g*	0	4	0	3	−1	2	2	4	17	33
10 956.7	1.179	1,*u*								2	17	<25
10 956.8	1.166	0,u^-	0	1	2	3	−1	1	1	3	17	29
		0,u^-	1	2	0	5	−1	1	1	3	17	52
10 957.4	1.191	2,*u*								1	17	<25
10 958.2	1.191	0,u^+								1	17	<25
10 959.1	1.169	0,g^+								3	17	<25
10 959.2	1.191	2,*g*								1	17	<25
10 961.2	1.166	2,*u*	1	2	0	5	1	1	1	3	17	46
10 962.0	1.167	0,g^-	1	1	1	3	−1	1	1	3	17	34
10 962.3	1.196	1,*g*	0	0	1	0	0	11	1	1	16	51
10 963.4	1.168	2,*u*	0	2	1	4	4	2	−2	3	17	59
10 963.7	1.178	1,*u*	0	0	2	4	4	3	−3	2	17	28
10 963.8	1.205	1,*g*								0	17	<25
10 963.8	1.205	1,*u*								0	17	<25
10 963.8	1.207	0,u^-								0	16	<25
10 963.8	1.207	0,g^+								0	16	<25
10 965.6	1.179	1,*g*								2	17	<25
10 966.5	1.166	2,*g*	1	1	1	3	3	1	−1	3	17	28
10 968.3	1.176	1,*g*	2	0	0	7	1	0	0	2	17	37
10 968.6	1.179	1,*u*								2	17	<25
10 969.4	1.168	0,u^+	0	2	1	4	2	2	−2	3	17	38
10 970.7	1.155	1,*g*	0	2	2	1	1	0	0	4	17	52

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 970.9	1.208	2,g								0	16	<25
10 972.7	1.208	2,u								0	16	<25
10 973.1	1.192	0,g^-	0	1	0	10	−4	4	4	1	17	31
10 973.3	1.191	0,u^+								1	17	<25
10 973.4	1.149	0,u^+	0	5	0	1	1	1	−1	5	17	98
10 974.0	1.191	0,g^+								1	17	<25
10 975.4	1.168	2,g	1	1	1	3	1	1	1	3	17	28
10 976.2	1.177	1,g								2	17	<25
10 977.0	1.191	2,g								1	17	<25
10 978.3	1.169	0,g^-	1	1	1	3	−1	1	1	3	17	32
		0,g^-	0	3	0	4	−4	4	4	3	17	39
10 978.5	1.191	2,u								1	17	<25
10 979.3	1.208	0,g^+								0	16	<25
10 979.7	1.190	2,g								1	17	<25
10 980.1	1.185	0,g^+	0	2	0	0	0	10	0	2	16	76
10 981.3	1.177	1,g	1	0	1	4	4	3	−3	2	17	29
10 982.2	1.190	0,u^+								1	17	<25
10 982.6	1.168	0,u^-	0	2	1	4	−2	2	2	3	17	63
10 983.7	1.190	2,u								1	17	<25
10 984.2	1.191	2,g								1	17	<25
10 984.2	1.190	0,g^+	1	0	0	10	0	2	0	1	17	28
10 984.3	1.178	1,u								2	17	<25
10 985.3	1.192	0,u^-								1	17	<25
10 986.6	1.181	1,u								2	17	<25
10 987.2	1.149	0,u^-	0	5	0	1	−1	1	1	5	17	100
10 987.6	1.168	2,u	0	2	1	4	2	2	0	3	17	40
10 988.0	1.208	2,g								0	16	<25
10 989.6	1.179	1,u								2	17	<25
10 990.1	1.171	0,u^-	0	3	0	5	−1	3	1	3	17	70
10 990.7	1.191	2,u								1	17	<25
10 992.4	1.192	0,u^+								1	17	<25
10 993.3	1.185	2,g	0	2	0	0	0	10	2	2	16	76
10 993.5	1.192	2,g								1	17	<25
10 993.6	1.208	0,g^-	0	0	0	2	−2	14	2	0	16	43
10 994.7	1.180	1,u								2	17	<25
10 995.0	1.149	2,u	0	5	0	1	1	1	1	5	17	100
10 995.1	1.192	0,g^+								1	17	<25
10 995.2	1.181	1,g								2	17	<25
10 996.6	1.171	2,u	0	3	0	5	1	3	1	3	17	44
10 996.7	1.193	1,g	1	0	0	1	1	10	0	1	16	30
		1,g	1	0	0	1	−1	10	2	1	16	28
10 996.8	1.206	1,u								0	17	<25
10 996.8	1.206	1,g								0	17	<25
10 997.5	1.170	0,g^+	0	3	0	4	4	4	−4	3	17	48
10 997.6	1.179	1,g								2	17	<25
10 998.3	1.166	0,u^+	0	2	1	4	0	2	0	3	17	25
10 998.7	1.196	1,u	1	0	0	0	0	11	1	1	16	26
		1,u	0	1	0	0	0	13	1	1	16	36
10 999.6	1.163	0,u^+	2	0	1	2	0	0	0	3	17	40
11 000.0	1.168	2,g	1	2	0	4	4	2	−2	3	17	42
11 000.0	1.192	0,u^-								1	17	<25
11 000.8	1.209	0,u^+	0	0	0	1	1	15	−1	0	16	36
11 001.2	1.161	2,u	2	0	1	2	2	0	0	3	17	59
		2,u	0	0	3	2	2	0	0	3	17	27
11 001.6	1.156	1,g	0	3	1	2	2	1	−1	4	17	65
11 001.7	1.192	0,g^-								1	17	<25
11 002.4	1.191	0,g^+								1	17	<25
11 002.6	1.165	0,g^+	2	1	0	4	0	0	0	3	17	40
11 002.9	1.192	2,u								1	17	<25
11 003.1	1.191	2,g								1	17	<25
11 005.6	1.178	1,g								2	17	<25
11 006.4	1.157	1,g	0	3	1	2	0	1	1	4	17	79
11 006.5	1.208	2,g	0	0	0	2	−2	14	4	0	16	31
11 006.6	1.205	1,g								0	17	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 006.7	1.205	1,*u*								0	17	<25
11 007.9	1.167	0,g^+	1	2	0	4	2	2	−2	3	17	35
11 008.1	1.166	2,*g*	2	1	0	4	2	0	0	3	17	41
11 008.2	1.191	2,*u*								1	17	<25
11 009.2	1.169	2,*u*	0	2	1	4	0	2	2	3	17	43
11 009.3	1.192	0,u^+								1	17	<25
11 009.8	1.167	2,*g*	2	1	0	4	2	0	0	3	17	25
11 009.9	1.154	1,*u*	1	2	1	1	1	0	0	4	17	68
11 010.8	1.192	2,*u*								1	17	<25
11 010.9	1.191	2,*g*								1	17	<25
11 011.3	1.177	1,*u*	2	0	0	6	2	1	−1	2	17	29
11 011.6	1.180	1,*g*								2	17	<25
11 011.9	1.209	2,*u*								0	16	<25
11 013.4	1.193	0,u^-	0	0	1	6	−6	6	6	1	17	30
11 013.6	1.191	2,*g*								1	17	<25
11 013.8	1.192	0,g^+								1	17	<25
11 014.2	1.179	1,*u*								2	17	<25
11 014.8	1.177	1,*u*								2	17	<25
11 015.9	1.179	1,*g*								2	17	<25
11 016.0	1.191	2,*u*								1	17	<25
11 016.5	1.165	0,g^+								3	17	<25
11 017.0	1.168	0,g^-								3	17	<25
11 017.4	1.192	0,g^-								1	17	<25
11 018.7	1.190	0,u^-								1	17	<25
11 019.4	1.179	1,*u*								2	17	<25
11 021.5	1.192	2,*g*								1	17	<25
11 021.6	1.191	0,u^+								1	17	<25
11 022.6	1.190	0,g^+	0	1	0	14	0	0	0	1	17	34
11 024.8	1.191	2,*u*								1	17	<25
11 024.9	1.168	2,*g*								3	17	<25
11 024.9	1.192	2,*g*								1	17	<25
11 025.4	1.190	0,g^-								1	17	<25
11 025.7	1.192	0,u^+								1	17	<25
11 026.6	1.166	0,u^+	1	1	1	2	2	2	−2	3	17	25
11 027.7	1.167	0,g^-	0	1	2	2	−2	2	2	3	17	37
		0,g^-	1	2	0	4	−2	2	2	3	17	49
11 029.8	1.195	1,*u*	1	0	0	0	0	11	1	1	16	45
11 030.3	1.191	2,*g*	1	0	0	8	6	4	−4	1	17	31
11 031.0	1.191	2,*u*								1	17	<25
11 031.5	1.179	1,*g*								2	17	<25
11 032.4	1.159	1,*u*								4	17	<25
11 032.6	1.180	1,*u*	0	1	1	5	5	4	−4	2	17	31
11 032.9	1.205	1,*u*								0	17	<25
11 032.9	1.205	1,*g*								0	17	<25
11 033.0	1.167	0,g^+								3	17	<25
11 034.6	1.191	2,*u*	1	0	0	7	7	5	−5	1	17	25
11 035.2	1.167	2,*g*								3	17	<25
11 037.3	1.190	2,*g*								1	17	<25
11 038.8	1.193	0,u^+								1	17	<25
11 039.4	1.191	0,u^-	1	0	0	9	−3	3	3	1	17	32
11 039.7	1.208	0,u^-	0	0	0	1	−1	15	1	0	16	44
11 040.4	1.180	1,*g*								2	17	<25
11 041.2	1.180	1,*g*								2	17	<25
11 041.6	1.163	0,u^+	0	0	3	0	0	2	0	3	17	56
11 042.0	1.168	2,*g*								3	17	<25
11 042.9	1.180	1,*u*								2	17	<25
11 043.8	1.165	2,*u*	1	1	1	2	2	2	0	3	17	26
11 043.9	1.176	1,*u*	2	0	0	6	0	1	1	2	17	27
11 044.0	1.178	1,*g*								2	17	<25
11 045.3	1.172	0,g^-	0	3	0	4	−2	4	2	3	17	59
11 046.5	1.178	1,*u*								2	17	<25
11 047.7	1.158	1,*u*	1	3	0	2	2	1	−1	4	17	55
		1,*u*	0	4	0	2	−2	3	3	4	17	27
11 048.4	1.192	2,*u*								1	17	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 048.6	1.192	$0,g^-$								1	17	<25
11 048.7	1.192	$0,g^+$								1	17	<25
11 049.1	1.192	$0,u^+$								1	17	<25
11 049.9	1.208	$2,u$	0	0	0	1	−1	15	3	0	16	26
11 050.4	1.192	$0,g^+$								1	17	<25
11 050.7	1.191	$2,u$								1	17	<25
11 051.0	1.180	$1,u$								2	17	<25
11 051.2	1.166	$0,u^-$	1	1	1	2	−2	2	2	3	17	73
11 051.5	1.192	$2,g$								1	17	<25
11 052.6	1.164	$0,g^+$	1	0	2	0	0	2	0	3	17	59
11 054.1	1.205	$1,u$								0	17	<25
11 054.7	1.170	$2,g$	0	3	0	4	−2	4	4	3	17	32
11 055.0	1.205	$1,g$								0	17	<25
11 056.0	1.163	$2,u$	0	0	3	0	0	2	2	3	17	52
11 056.5	1.179	$1,u$								2	17	<25
11 056.5	1.192	$0,u^-$								1	17	<25
11 057.2	1.193	$0,g^+$								1	17	<25
11 058.4	1.158	$1,u$	1	3	0	2	0	1	1	4	17	55
		$1,u$	0	4	0	2	2	3	−1	4	17	33
11 060.3	1.180	$1,g$								2	17	<25
11 062.0	1.166	$0,g^+$	1	2	0	4	0	2	0	3	17	30
11 062.2	1.180	$1,g$								2	17	<25
11 062.4	1.192	$2,g$								1	17	<25
11 062.7	1.193	$0,u^-$	1	0	0	7	−5	5	5	1	17	29
11 063.1	1.192	$2,u$								1	17	<25
11 063.2	1.159	$1,u$	0	4	0	2	−2	3	3	4	17	39
11 063.5	1.205	$1,u$								0	17	<25
11 065.2	1.205	$1,g$								0	17	<25
11 065.2	1.210	$0,g^+$	0	0	0	0	0	16	0	0	16	61
11 065.3	1.166	$2,g$	1	0	2	0	0	2	2	3	17	31
11 065.9	1.191	$0,g^-$	1	0	0	8	−4	4	4	1	17	32
11 066.5	1.168	$0,g^+$	0	2	1	3	3	3	−3	3	17	32
		$0,g^+$	0	2	1	3	1	3	−1	3	17	28
11 067.2	1.192	$2,u$								1	17	<25
11 068.6	1.178	$1,g$								2	17	<25
11 069.3	1.206	$1,g$								0	17	<25
11 070.0	1.206	$1,u$								0	17	<25
11 070.3	1.192	$2,g$								1	17	<25
11 071.4	1.170	$0,u^+$	0	3	0	3	1	5	−1	3	17	30
11 071.5	1.164	$2,g$	1	0	2	0	0	2	2	3	17	42
11 072.6	1.179	$1,g$								2	17	<25
11 073.0	1.197	$1,g$								1	16	<25
11 074.5	1.206	$1,g$	0	0	0	9	9	8	−8	0	17	48
11 074.6	1.146	$0,u^+$	0	4	1	0	0	0	0	5	17	98
11 074.8	1.169	$0,g^-$	0	2	1	3	−3	3	3	3	17	59
11 075.2	1.191	$2,g$								1	17	<25
11 075.5	1.192	$0,u^-$								1	17	<25
11 075.7	1.205	$1,u$								0	17	<25
11 076.5	1.210	$2,g$	0	0	0	0	0	16	2	0	16	60
11 076.8	1.192	$2,u$								1	17	<25
11 077.8	1.181	$1,g$								2	17	<25
11 078.2	1.192	$0,g^-$								1	17	<25
11 078.3	1.178	$1,u$								2	17	<25
11 078.5	1.191	$0,g^+$								1	17	<25
11 078.9	1.192	$0,u^+$								1	17	<25
11 079.0	1.191	$2,g$								1	17	<25
11 079.3	1.179	$1,g$								2	17	<25
11 079.5	1.169	$2,g$	0	2	1	3	3	3	−1	3	17	45
11 080.5	1.166	$0,u^+$	1	1	1	2	2	2	−2	3	17	31
		$0,u^+$	1	1	1	2	0	2	0	3	17	40
11 080.7	1.166	$2,u$								3	17	<25
11 081.3	1.179	$1,u$								2	17	<25
11 083.2	1.205	$1,g$								0	17	<25
11 085.0	1.180	$1,g$								2	17	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 085.9	1.193	$0,u^-$								1	17	<25
11 086.4	1.198	$1,u$	0	1	0	0	0	13	1	1	16	48
11 086.4	1.192	$0,g^+$								1	17	<25
11 087.3	1.192	$0,u^+$								1	17	<25
11 088.3	1.192	$2,u$								1	17	<25
11 088.7	1.192	$2,g$								1	17	<25
11 089.2	1.170	$2,u$								3	17	<25
11 089.6	1.182	$1,u$								2	17	<25
11 090.0	1.193	$0,u^+$	0	1	0	7	7	7	−7	1	17	32
11 090.5	1.192	$0,u^+$								1	17	<25
11 090.5	1.169	$0,g^+$	0	2	1	3	3	3	−3	3	17	34
		$0,g^+$	0	2	1	3	1	3	−1	3	17	31
11 090.7	1.192	$0,g^-$								1	17	<25
11 092.4	1.193	$2,u$								1	17	<25
11 093.3	1.192	$2,g$								1	17	<25
11 093.7	1.161	$1,u$	0	4	0	2	0	3	1	4	17	60
11 093.9	1.177	$1,g$								2	17	<25
11 094.7	1.205	$1,u$								0	17	<25
11 096.1	1.192	$2,u$								1	17	<25
11 096.6	1.164	$2,u$	2	1	0	3	3	1	−1	3	17	57
11 096.6	1.164	$0,u^+$	2	1	0	3	1	1	−1	3	17	68
11 097.0	1.180	$1,u$								2	17	<25
11 097.8	1.161	$0,g^+$	2	0	1	1	1	1	−1	3	17	55
11 099.3	1.193	$2,u$								1	17	<25
11 099.8	1.170	$0,u^-$	1	2	0	3	−3	3	3	3	17	29
		$0,u^-$	0	3	0	3	−3	5	3	3	17	31
11 100.1	1.169	$2,g$	0	2	1	3	−1	3	3	3	17	26
11 100.5	1.192	$0,u^-$	0	0	1	6	−6	6	6	1	17	28
11 100.7	1.172	$0,g^+$	0	3	0	4	2	4	−2	3	17	38
		$0,g^+$	0	3	0	4	0	4	0	3	17	41
11 101.0	1.193	$0,g^-$								1	17	<25
11 101.5	1.180	$1,g$								2	17	<25
11 101.7	1.191	$0,g^+$								1	17	<25
11 104.0	1.192	$2,g$								1	17	<25
11 104.3	1.179	$1,g$								2	17	<25
11 104.9	1.180	$1,u$								2	17	<25
11 107.3	1.192	$0,g^+$	1	0	0	6	6	6	−6	1	17	29
11 107.7	1.192	$2,u$								1	17	<25
11 108.0	1.172	$2,g$	0	3	0	4	2	4	0	3	17	33
		$2,g$	0	3	0	4	0	4	2	3	17	34
11 109.0	1.193	$2,g$								1	17	<25
11 109.2	1.169	$0,u^+$	1	2	0	3	3	3	−3	3	17	40
		$0,u^+$	1	2	0	3	1	3	−1	3	17	26
11 109.6	1.167	$0,g^-$	0	2	1	3	−1	3	1	3	17	50
11 110.0	1.205	$1,g$	0	0	0	9	−7	8	8	0	17	27
11 111.4	1.179	$1,u$								2	17	<25
11 111.4	1.164	$0,g^-$	2	0	1	1	−1	1	1	3	17	47
11 112.8	1.156	$1,u$	0	2	2	0	0	1	1	4	17	49
11 113.2	1.192	$2,g$								1	17	<25
11 113.6	1.180	$1,g$								2	17	<25
11 114.6	1.163	$0,u^-$	2	1	0	3	−1	1	1	3	17	79
11 114.8	1.169	$2,u$								3	17	<25
11 115.9	1.161	$2,g$	2	0	1	1	1	1	1	3	17	51
11 118.3	1.193	$0,u^+$								1	17	<25
11 118.5	1.208	$0,g^-$								0	16	<25
11 118.6	1.208	$0,u^+$								0	16	<25
11 119.0	1.179	$1,u$								2	17	<25
11 121.3	1.181	$1,g$								2	17	<25
11 122.1	1.170	$2,g$	0	2	1	3	1	3	1	3	17	34
		$2,g$	0	2	1	3	−1	3	3	3	17	30
11 122.8	1.193	$0,g^+$								1	17	<25
11 122.9	1.165	$2,u$	2	1	0	3	1	1	1	3	17	59
11 122.9	1.206	$1,u$								0	17	<25
11 123.1	1.170	$0,u^-$	1	2	0	3	−3	3	3	3	17	50

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,u^-$	0	3	0	3	−3	5	3	3	17	31
11 124.1	1.193	$0,g^-$	1	0	0	6	−6	6	6	1	17	42
11 126.3	1.193	2,*g*								1	17	<25
11 126.4	1.177	1,*u*	2	0	0	4	4	3	−3	2	17	25
11 126.5	1.206	1,*g*								0	17	<25
11 126.5	1.193	$0,u^-$								1	17	<25
11 126.7	1.208	2,*u*								0	16	<25
11 126.7	1.208	2,*g*								0	16	<25
11 127.5	1.192	$0,u^+$								1	17	<25
11 127.8	1.193	2,*u*								1	17	<25
11 127.8	1.168	$0,u^+$								3	17	<25
11 129.1	1.175	1,*g*	2	0	0	5	1	2	0	2	17	36
11 129.1	1.170	2,*u*								3	17	<25
11 131.5	1.206	1,*g*								0	17	<25
11 132.1	1.146	$0,g^+$	1	4	0	0	0	0	0	5	17	90
11 132.4	1.206	1,*u*								0	17	<25
11 133.3	1.193	2,*u*								1	17	<25
11 133.7	1.192	$0,g^+$								1	17	<25
11 134.5	1.181	1,*g*								2	17	<25
11 134.5	1.193	$0,u^+$								1	17	<25
11 135.8	1.168	$0,u^+$	0	1	2	1	1	3	−1	3	17	42
11 135.9	1.179	1,*u*								2	17	<25
11 137.5	1.193	2,*g*								1	17	<25
11 138.0	1.181	1,*g*								2	17	<25
11 138.5	1.207	1,*u*								0	17	<25
11 139.6	1.178	1,*u*	2	0	0	4	4	3	−3	2	17	26
11 139.6	1.193	2,*u*								1	17	<25
11 141.2	1.193	2,*g*								1	17	<25
11 141.7	1.169	2,*u*	1	2	0	3	3	3	−1	3	17	26
11 141.9	1.158	1,*u*	0	3	1	1	1	2	0	4	17	75
11 142.8	1.181	1,*g*								2	17	<25
11 143.4	1.191	$0,u^-$								1	17	<25
11 145.2	1.206	1,*g*								0	17	<25
11 145.4	1.193	2,*u*								1	17	<25
11 146.8	1.157	1,*u*	0	2	2	0	0	1	1	4	17	26
		1,*u*	0	3	1	1	−1	2	2	4	17	65
11 147.0	1.192	2,*u*								1	17	<25
11 147.2	1.181	1,*u*								2	17	<25
11 147.5	1.193	$0,g^+$								1	17	<25
11 148.1	1.154	1,*g*	2	2	0	1	1	0	0	4	17	30
		1,*g*	1	2	1	0	0	1	1	4	17	44
11 148.9	1.160	$0,g^+$	3	0	0	2	0	0	0	3	17	75
11 149.2	1.191	$0,g^-$								1	17	<25
11 150.2	1.206	1,*u*	0	0	0	8	−8	9	9	0	17	46
11 150.2	1.168	$0,u^-$	0	1	2	1	−1	3	1	3	17	46
11 150.4	1.178	1,*g*								2	17	<25
11 150.4	1.167	2,*u*	0	1	2	1	1	3	1	3	17	26
11 150.9	1.193	2,*g*								1	17	<25
11 151.7	1.159	2,*g*	3	0	0	2	2	0	0	3	17	76
11 151.8	1.193	$0,u^+$								1	17	<25
11 152.0	1.166	$0,g^+$	1	1	1	1	1	3	−1	3	17	45
11 156.4	1.208	$0,u^-$	0	0	0	1	−1	15	1	0	16	30
11 157.8	1.181	1,*u*								2	17	<25
11 158.1	1.208	$0,g^+$								0	16	<25
11 158.4	1.172	$0,u^+$	0	3	0	3	3	5	−3	3	17	44
		$0,u^+$	0	3	0	3	1	5	−1	3	17	28
11 158.5	1.193	$0,g^+$								1	17	<25
11 158.6	1.193	$0,g^-$								1	17	<25
11 158.8	1.150	$0,g^+$	0	5	0	0	0	2	0	5	17	91
11 159.1	1.193	$0,g^+$								1	17	<25
11 159.5	1.193	2,*g*								1	17	<25
11 159.9	1.169	2,*u*								3	17	<25
11 160.1	1.205	1,*u*								0	17	<25
11 160.9	1.192	2,*u*								1	17	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 162.0	1.180	1,*u*								2	17	<25
11 163.9	1.194	0,u^-								1	17	<25
11 165.4	1.181	1,*g*								2	17	<25
11 166.3	1.178	1,*u*	2	0	0	4	−2	3	3	2	17	26
11 166.4	1.208	2,*u*								0	16	<25
11 166.7	1.153	1,*g*	2	2	0	1	1	0	0	4	17	57
11 167.3	1.193	2,*g*								1	17	<25
11 167.6	1.194	0,g^-								1	17	<25
11 168.0	1.166	2,*g*	1	1	1	1	1	3	1	3	17	31
11 168.2	1.192	0,u^-								1	17	<25
11 168.3	1.208	2,*g*								0	16	<25
11 168.9	1.193	2,*g*								1	17	<25
11 169.2	1.168	0,u^-	1	2	0	3	−1	3	1	3	17	58
11 170.2	1.150	2,*g*	0	5	0	0	0	2	2	5	17	100
11 170.7	1.171	2,*u*								3	17	<25
11 170.8	1.206	1,*g*								0	17	<25
11 171.1	1.183	1,*u*								2	17	<25
11 172.7	1.194	0,u^+								1	17	<25
11 172.9	1.178	1,*u*								2	17	<25
11 173.8	1.206	1,*u*								0	17	<25
11 174.4	1.192	2,*u*								1	17	<25
11 175.0	1.193	2,*u*								1	17	<25
11 175.7	1.193	2,*g*								1	17	<25
11 179.0	1.168	2,*u*	1	2	0	3	1	3	1	3	17	36
11 179.9	1.158	1,*g*	1	2	1	0	0	1	1	4	17	27
		1,*g*	1	3	0	1	1	2	0	4	17	25
11 180.4	1.193	2,*g*								1	17	<25
11 180.5	1.204	1,*g*	0	0	0	17	1	0	0	0	17	28
11 182.0	1.169	0,u^+	0	2	1	2	2	4	−2	3	17	36
		0,u^+	0	2	1	2	0	4	0	3	17	25
11 182.2	1.180	1,*u*								2	17	<25
11 183.0	1.183	1,*g*								2	17	<25
11 185.1	1.193	2,*u*								1	17	<25
11 185.3	1.193	0,u^-								1	17	<25
11 186.3	1.166	0,g^-	1	1	1	1	−1	3	1	3	17	52
11 187.0	1.194	0,u^+								1	17	<25
11 187.7	1.181	1,*u*								2	17	<25
11 187.8	1.181	1,*g*								2	17	<25
11 190.5	1.193	0,g^-								1	17	<25
11 193.6	1.179	1,*u*								2	17	<25
11 196.7	1.205	1,*g*								0	17	<25
11 197.0	1.169	2,*u*	0	2	1	2	2	4	0	3	17	30
11 197.5	1.179	1,*g*	1	0	1	2	−2	5	3	2	17	26
11 197.7	1.194	0,g^+								1	17	<25
11 197.8	1.157	1,*g*	1	3	0	1	1	2	0	4	17	33
		1,*g*	1	3	0	1	−1	2	2	4	17	53
11 198.0	1.167	0,g^+	2	1	0	2	2	2	−2	3	17	42
11 198.5	1.193	2,*u*								1	17	<25
11 199.2	1.206	1,*u*								0	17	<25
11 200.0	1.207	1,*g*								0	17	<25
11 200.1	1.166	2,*g*	1	1	1	1	−1	3	3	3	17	49
11 200.1	1.170	0,u^-	0	2	1	2	−2	4	2	3	17	69
11 200.2	1.193	2,*g*								1	17	<25
11 200.8	1.168	0,g^+	1	1	1	1	1	3	−1	3	17	30
11 201.4	1.194	0,g^-								1	17	<25
11 201.8	1.194	2,*u*								1	17	<25
11 202.8	1.206	1,*u*								0	17	<25
11 203.7	1.193	2,*g*								1	17	<25
11 205.4	1.160	1,*g*	0	4	0	1	−1	4	2	4	17	35
11 206.7	1.180	1,*g*								2	17	<25
11 207.6	1.180	1,*u*								2	17	<25
11 208.2	1.206	1,*u*								0	17	<25
11 210.4	1.165	0,g^-	2	1	0	2	−2	2	2	3	17	60
		0,g^-	1	1	1	1	−1	3	1	3	17	32

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 210.7	1.193	$0,u^-$								1	17	<25
11 211.3	1.207	$1,g$								0	17	<25
11 213.2	1.173	$0,u^-$	0	3	0	3	−1	5	1	3	17	70
11 213.8	1.194	$0,g^+$								1	17	<25
11 213.9	1.182	$1,g$								2	17	<25
11 214.0	1.170	$2,u$	0	2	1	2	2	4	0	3	17	29
		$2,u$	0	2	1	2	−2	4	4	3	17	37
11 214.4	1.192	$0,g^+$								1	17	<25
11 214.7	1.170	$2,g$								3	17	<25
11 215.1	1.181	$1,u$								2	17	<25
11 215.3	1.194	$2,g$	0	1	0	6	−6	8	8	1	17	25
11 216.1	1.193	$0,u^+$								1	17	<25
11 216.5	1.193	$2,u$								1	17	<25
11 218.3	1.162	$0,u^+$	2	0	1	0	0	2	0	3	17	52
11 218.5	1.176	$1,u$	2	0	0	4	0	3	1	2	17	38
11 218.8	1.192	$2,g$								1	17	<25
11 219.5	1.165	$2,g$	2	1	0	2	2	2	0	3	17	32
		$2,g$	1	1	1	1	1	3	1	3	17	31
11 219.9	1.178	$1,g$								2	17	<25
11 221.3	1.173	$2,u$	0	3	0	3	1	5	1	3	17	42
11 221.7	1.192	$0,u^+$								1	17	<25
11 222.4	1.170	$0,u^+$	0	2	1	2	2	4	−2	3	17	33
		$0,u^+$	0	2	1	2	0	4	0	3	17	47
11 223.3	1.194	$0,u^-$								1	17	<25
11 225.3	1.182	$1,u$								2	17	<25
11 225.4	1.164	$0,g^+$	2	1	0	2	0	2	0	3	17	59
11 225.5	1.193	$2,u$								1	17	<25
11 226.8	1.194	$0,g^-$								1	17	<25
11 230.9	1.194	$2,g$								1	17	<25
11 231.2	1.193	$2,u$								1	17	<25
11 231.4	1.181	$1,u$								2	17	<25
11 231.4	1.181	$1,g$								2	17	<25
11 233.3	1.162	$2,u$	2	0	1	0	0	2	2	3	17	55
		$2,u$	0	0	3	0	0	2	2	3	17	26
11 233.3	1.192	$0,g^+$								1	17	<25
11 233.4	1.194	$0,u^-$								1	17	<25
11 234.6	1.162	$1,g$	0	4	0	1	1	4	0	4	17	49
		$1,g$	0	4	0	1	−1	4	2	4	17	40
11 235.2	1.207	$1,g$								0	17	<25
11 235.6	1.193	$2,g$								1	17	<25
11 235.8	1.170	$2,u$	0	2	1	2	0	4	2	3	17	42
11 236.5	1.194	$0,u^+$								1	17	<25
11 236.6	1.207	$1,u$								0	17	<25
11 236.9	1.170	$0,g^-$	1	2	0	2	−2	4	2	3	17	60
11 237.4	1.171	$0,g^+$	1	2	0	2	2	4	−2	3	17	36
11 238.0	1.164	$2,g$	2	1	0	2	0	2	2	3	17	55
11 238.9	1.194	$2,u$								1	17	<25
11 241.0	1.177	$1,g$	2	0	0	3	−3	4	4	2	17	45
11 243.2	1.194	$2,u$								1	17	<25
11 243.2	1.193	$2,g$								1	17	<25
11 243.3	1.206	$1,u$								0	17	<25
11 247.8	1.194	$0,g^-$								1	17	<25
11 248.2	1.181	$1,u$								2	17	<25
11 249.7	1.194	$0,g^+$								1	17	<25
11 250.4	1.170	$2,g$	1	2	0	2	2	4	0	3	17	27
		$2,g$	1	2	0	2	−2	4	4	3	17	35
11 250.7	1.194	$2,u$								1	17	<25
11 251.5	1.208	$1,g$								0	17	<25
11 251.9	1.171	$2,g$								3	17	<25
11 252.0	1.193	$0,u^+$	1	0	0	5	5	7	−5	1	17	27
11 253.1	1.179	$1,g$								2	17	<25
11 254.7	1.194	$2,g$								1	17	<25
11 255.7	1.160	$0,u^+$	3	0	0	1	1	1	−1	3	17	76
11 257.8	1.179	$1,g$								2	17	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 260.9	1.160	$0,u^-$	3	0	0	1	−1	1	1	3	17	90
11 261.6	1.194	$2,u$								1	17	<25
11 262.2	1.194	$2,g$								1	17	<25
11 263.8	1.184	$1,g$								2	17	<25
11 264.8	1.169	$0,g^+$	0	1	2	0	0	4	0	3	17	50
11 265.1	1.195	$0,u^-$								1	17	<25
11 266.6	1.182	$1,g$								2	17	<25
11 267.3	1.204	$1,g$	0	0	0	17	1	0	0	0	17	32
11 267.9	1.179	$1,u$	1	0	1	1	1	6	0	2	17	26
11 269.3	1.182	$1,g$								2	17	<25
11 271.3	1.173	$0,g^-$	1	2	0	2	−2	4	2	3	17	25
		$0,g^-$	0	3	0	2	−2	6	2	3	17	67
11 271.9	1.194	$0,u^+$								1	17	<25
11 273.4	1.195	$0,g^+$								1	17	<25
11 274.4	1.195	$2,u$								1	17	<25
11 274.6	1.160	$2,u$	3	0	0	1	1	1	1	3	17	79
11 274.7	1.183	$1,u$								2	17	<25
11 276.1	1.208	$1,u$								0	17	<25
11 276.6	1.170	$2,g$	0	1	2	0	0	4	2	3	17	27
11 277.0	1.207	$1,u$								0	17	<25
11 277.7	1.208	$1,g$								0	17	<25
11 278.4	1.178	$1,g$	1	0	1	2	0	5	1	2	17	32
11 278.6	1.169	$0,g^+$	1	2	0	2	2	4	−2	3	17	27
		$0,g^+$	1	2	0	2	0	4	0	3	17	43
11 280.0	1.183	$1,u$								2	17	<25
11 283.6	1.159	$1,g$	0	3	1	0	0	3	1	4	17	94
11 284.9	1.171	$2,g$	0	3	0	2	−2	6	4	3	17	34
11 285.6	1.194	$2,u$								1	17	<25
11 287.1	1.194	$0,g^-$	1	0	0	4	−4	8	4	1	17	27
11 287.8	1.192	$0,u^-$								1	17	<25
11 288.3	1.195	$2,g$								1	17	<25
11 288.6	1.194	$0,g^+$								1	17	<25
11 289.9	1.169	$2,g$	1	2	0	2	0	4	2	3	17	41
11 290.7	1.167	$0,u^+$	1	1	1	0	0	4	0	3	17	43
11 291.5	1.192	$0,g^-$								1	17	<25
11 293.2	1.194	$2,g$								1	17	<25
11 293.2	1.192	$2,u$								1	17	<25
11 293.8	1.208	$0,u^-$	0	0	0	5	−1	11	1	0	16	27
11 293.8	1.208	$0,g^+$								0	16	<25
11 294.5	1.206	$1,g$								0	17	<25
11 294.9	1.181	$1,u$								2	17	<25
11 297.0	1.193	$0,u^-$								1	17	<25
11 298.6	1.193	$2,g$								1	17	<25
11 299.2	1.181	$1,g$								2	17	<25
11 301.9	1.194	$0,u^+$								1	17	<25
11 302.1	1.153	$1,u$	2	2	0	0	0	1	1	4	17	81
11 302.2	1.208	$2,u$								0	16	<25
11 302.3	1.208	$2,g$								0	16	<25
11 303.0	1.195	$0,g^+$	0	0	1	3	1	9	−1	1	17	26
11 303.2	1.194	$2,g$								1	17	<25
11 304.6	1.160	$0,g^+$	0	4	0	6	0	0	0	4	18	93
11 305.7	1.167	$2,u$	1	1	1	0	0	4	2	3	17	46
11 306.4	1.193	$2,u$								1	17	<25
11 306.9	1.170	$0,g^+$	0	2	1	1	1	5	−1	3	17	66
11 308.0	1.160	$2,g$	0	4	0	6	2	0	0	4	18	94
11 308.8	1.178	$1,g$	2	0	0	3	1	4	0	2	17	31
11 310.0	1.208	$1,g$								0	17	<25
11 311.4	1.181	$1,g$								2	17	<25
11 312.2	1.195	$0,g^+$								1	17	<25
11 313.8	1.194	$2,u$								1	17	<25
11 314.7	1.182	$1,g$								2	17	<25
11 315.5	1.195	$0,u^+$								1	17	<25
11 316.0	1.195	$2,g$								1	17	<25
11 317.7	1.207	$1,u$								0	17	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 318.1	1.195	$0,u^+$								1	17	<25
11 320.6	1.205	$1,u$								0	17	<25
11 320.9	1.181	$1,u$								2	17	<25
11 321.4	1.170	$2,g$	0	2	1	1	1	5	1	3	17	42
		$2,g$	0	2	1	1	−1	5	3	3	17	25
11 324.2	1.195	$2,u$								1	17	<25
11 324.4	1.195	$0,u^-$								1	17	<25
11 324.5	1.182	$1,g$								2	17	<25
11 324.9	1.209	$1,u$								0	17	<25
11 325.2	1.195	$2,g$								1	17	<25
11 325.4	1.174	$0,g^+$	0	3	0	2	2	6	−2	3	17	39
		$0,g^+$	0	3	0	2	0	6	0	3	17	46
11 325.9	1.169	$1,g$	0	3	0	9	1	0	0	3	18	66
11 325.9	1.195	$0,g^-$								1	17	<25
11 327.4	1.166	$0,u^+$	2	1	0	1	1	3	−1	3	17	54
		$0,u^+$	1	1	1	0	0	4	0	3	17	41
11 328.5	1.178	$1,u$	2	0	0	2	0	5	1	2	17	27
11 330.0	1.207	$1,g$								0	17	<25
11 330.7	1.195	$2,u$								1	17	<25
11 332.8	1.171	$0,g^-$	0	2	1	1	−1	5	1	3	17	87
11 333.5	1.183	$1,u$								2	17	<25
11 334.4	1.174	$2,g$	0	3	0	2	2	6	0	3	17	28
		$2,g$	0	3	0	2	0	6	2	3	17	41
11 335.5	1.180	$1,u$								2	17	<25
11 336.6	1.177	$0,g^+$								2	18	<25
11 337.0	1.177	$0,u^+$								2	18	<25
11 337.2	1.165	$0,u^-$	2	1	0	1	−1	3	1	3	17	81
11 337.3	1.158	$1,u$	1	3	0	0	0	3	1	4	17	70
11 337.3	1.195	$2,g$								1	17	<25
11 339.6	1.195	$2,u$								1	17	<25
11 339.6	1.171	$0,u^+$	1	2	0	1	1	5	−1	3	17	42
		$0,u^+$	0	3	0	1	1	7	−1	3	17	32
11 341.0	1.166	$2,u$	2	1	0	1	−1	3	3	3	17	50
		$2,u$	1	1	1	0	0	4	2	3	17	33
11 342.5	1.177	$2,g$								2	18	<25
11 342.6	1.195	$0,g^-$	0	1	0	4	−4	10	4	1	17	27
11 343.0	1.177	$2,u$								2	18	<25
11 343.9	1.169	$1,u$	0	3	0	8	2	1	−1	3	18	27
11 347.6	1.171	$2,g$	0	2	1	1	1	5	1	3	17	32
		$2,g$	0	2	1	1	−1	5	3	3	17	41
11 350.6	1.165	$2,u$	2	1	0	1	1	3	1	3	17	52
		$2,u$	2	1	0	1	−1	3	3	3	17	25
11 351.6	1.195	$2,g$								1	17	<25
11 353.2	1.193	$0,g^+$	1	0	0	4	4	8	−4	1	17	27
11 354.2	1.171	$2,u$								3	17	<25
11 356.2	1.207	$1,u$								0	17	<25
11 356.3	1.208	$1,g$								0	17	<25
11 357.8	1.185	$1,u$								2	17	<25
11 359.8	1.183	$1,g$	0	1	1	2	−2	7	3	2	17	34
11 360.6	1.193	$0,u^+$								1	17	<25
11 363.3	1.178	$1,u$	2	0	0	2	−2	5	3	2	17	33
11 363.6	1.192	$0,g^+$								1	17	<25
11 364.2	1.193	$2,g$								1	17	<25
11 365.3	1.195	$0,u^-$								1	17	<25
11 366.0	1.185	$1,g$								2	17	<25
11 366.5	1.193	$2,u$								1	17	<25
11 370.8	1.193	$2,g$								1	17	<25
11 371.6	1.196	$0,g^-$								1	17	<25
11 372.6	1.196	$0,u^+$	0	1	0	3	1	11	−1	1	17	27
11 373.3	1.165	$1,g$	1	0	2	3	1	0	0	3	18	32
11 374.5	1.195	$2,u$								1	17	<25
11 376.5	1.195	$0,u^-$								1	17	<25
11 377.1	1.162	$1,u$	0	4	0	0	0	5	1	4	17	79
11 377.9	1.161	$0,g^+$	3	0	0	0	0	2	0	3	17	89

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 378.2	1.164	1,*u*	2	0	1	3	1	0	0	3	18	27
		1,*u*	0	0	3	3	1	0	0	3	18	39
11 378.4	1.160	$0,u^+$	0	4	0	5	1	1	−1	4	18	85
11 379.2	1.208	1,*u*								0	17	<25
11 380.5	1.182	1,*u*	0	0	2	0	0	7	1	2	17	37
11 380.6	1.161	2,*u*	0	4	0	5	3	1	−1	4	18	66
11 381.5	1.173	$0,u^+$	1	2	0	1	1	5	−1	3	17	38
		$0,u^+$	0	3	0	1	1	7	−1	3	17	57
11 382.1	1.195	$0,g^-$								1	17	<25
11 382.7	1.181	1,*g*	1	1	0	3	1	6	0	2	17	27
11 383.4	1.206	1,*g*								0	17	<25
11 384.7	1.195	2,*g*								1	17	<25
11 386.2	1.196	2,*u*								1	17	<25
11 386.5	1.170	$0,u^-$	1	2	0	1	−1	5	1	3	17	77
11 387.2	1.183	1,*u*	0	0	2	0	0	7	1	2	17	31
11 388.9	1.196	$0,g^+$								1	17	<25
11 389.5	1.195	2,*u*								1	17	<25
11 389.8	1.150	1,*g*	0	5	0	3	1	0	0	5	18	99
11 392.2	1.161	2,*g*	3	0	0	0	0	2	2	3	17	90
11 392.2	1.195	2,*g*								1	17	<25
11 394.7	1.173	2,*u*	1	2	0	1	−1	5	3	3	17	37
		2,*u*	0	3	0	1	1	7	1	3	17	30
11 397.8	1.168	1,*g*	1	0	2	3	1	0	0	3	18	26
11 398.2	1.177	1,*u*	2	0	0	2	0	5	1	2	17	45
11 399.1	1.170	2,*u*	1	2	0	1	1	5	1	3	17	50
11 399.5	1.180	1,*g*	1	0	1	0	0	7	1	2	17	50
11 400.6	1.182	1,*u*	1	1	0	2	2	7	−1	2	17	32
		1,*u*	1	1	0	2	−2	7	3	2	17	34
11 400.8	1.209	1,*g*								0	17	<25
11 402.9	1.196	2,*g*								1	17	<25
11 403.8	1.192	1,*u*								1	18	<25
11 403.8	1.192	1,*g*								1	18	<25
11 404.8	1.196	$0,u^+$	0	0	1	2	0	10	0	1	17	28
11 405.5	1.179	$0,g^+$	0	0	2	8	0	0	0	2	18	35
11 407.4	1.194	$0,u^-$	1	0	0	3	−3	9	3	1	17	46
11 407.6	1.170	1,*u*	0	3	0	8	2	1	−1	3	18	43
		1,*u*	0	3	0	8	0	1	1	3	18	25
11 407.8	1.209	1,*u*								0	17	<25
11 409.1	1.179	$0,u^+$	0	2	0	11	1	1	−1	2	18	25
11 409.3	1.179	2,*g*	0	0	2	8	2	0	0	2	18	33
11 409.9	1.178	$0,g^+$								2	18	<25
11 410.1	1.178	$0,u^+$	1	0	1	8	0	0	0	2	18	35
11 410.5	1.196	$0,u^+$	0	0	1	2	2	10	−2	1	17	27
11 412.9	1.179	2,*u*								2	18	<25
11 413.4	1.168	1,*u*	0	2	1	7	1	0	0	3	18	35
		1,*u*	0	3	0	8	0	1	1	3	18	29
11 413.9	1.208	1,*g*								0	17	<25
11 414.2	1.178	2,*u*	1	0	1	8	2	0	0	2	18	30
11 414.5	1.183	1,*g*	0	1	1	2	0	7	1	2	17	32
11 414.6	1.178	2,*g*								2	18	<25
11 415.0	1.195	2,*u*								1	17	<25
11 416.3	1.209	1,*u*								0	17	<25
11 418.4	1.196	2,*u*	0	0	1	2	0	10	2	1	17	25
11 418.5	1.161	$0,u^-$	0	4	0	5	−1	1	1	4	18	94
11 422.0	1.179	$0,u^-$								2	18	<25
11 422.8	1.179	$0,g^-$								2	18	<25
11 423.8	1.161	2,*u*	0	4	0	5	3	1	−1	4	18	26
		2,*u*	0	4	0	5	1	1	1	4	18	68
11 425.9	1.195	2,*u*								1	17	<25
11 426.8	1.193	$0,g^-$								1	17	<25
11 429.0	1.179	2,*u*								2	18	<25
11 429.5	1.179	2,*g*								2	18	<25
11 430.2	1.167	1,*g*	0	1	2	5	1	0	0	3	18	31
11 430.8	1.184	1,*u*	0	1	1	1	1	8	0	2	17	31

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$1,u$	0	1	1	1	−1	8	2	2	17	38
11 432.8	1.195	$0,g^+$	1	0	0	2	2	10	−2	1	17	32
11 434.2	1.210	$1,g$								0	17	<25
11 434.5	1.194	$2,g$								1	17	<25
11 435.6	1.174	$0,u^-$	0	3	0	1	−1	7	1	3	17	83
11 437.3	1.193	$0,u^-$								1	17	<25
11 437.7	1.196	$0,g^+$								1	17	<25
11 438.5	1.172	$0,u^+$	0	2	1	0	0	6	0	3	17	89
11 438.9	1.171	$1,g$	0	3	0	7	−1	2	2	3	18	34
11 442.6	1.196	$0,g^+$								1	17	<25
11 443.8	1.195	$2,g$								1	17	<25
11 443.9	1.194	$2,u$								1	17	<25
11 444.0	1.179	$0,g^+$								2	18	<25
11 444.7	1.169	$1,u$								3	18	<25
11 445.4	1.174	$2,u$	0	3	0	1	1	7	1	3	17	47
11 445.9	1.179	$1,g$	2	0	0	1	−1	6	2	2	17	28
		$1,g$	1	0	1	0	0	7	1	2	17	36
11 445.9	1.209	$1,g$								0	17	<25
11 446.1	1.167	$0,g^+$	2	1	0	0	0	4	0	3	17	72
11 446.6	1.179	$2,g$								2	18	<25
11 446.8	1.186	$1,g$								2	17	<25
11 447.2	1.207	$1,u$								0	17	<25
11 447.9	1.185	$1,u$	0	2	0	2	2	9	−1	2	17	27
		$1,u$	0	2	0	2	−2	9	3	2	17	33
11 450.7	1.195	$0,u^+$								1	17	<25
11 451.5	1.196	$2,g$								1	17	<25
11 452.8	1.195	$2,g$								1	17	<25
11 454.4	1.172	$2,u$	0	2	1	0	0	6	2	3	17	68
11 457.1	1.196	$0,u^-$								1	17	<25
11 459.0	1.158	$0,u^+$	0	3	1	4	0	0	0	4	18	84
11 460.4	1.167	$2,g$	2	1	0	0	0	4	2	3	17	73
11 462.4	1.195	$2,u$								1	17	<25
11 462.5	1.158	$2,u$	0	3	1	4	2	0	0	4	18	85
11 465.6	1.184	$1,g$								2	17	<25
11 467.2	1.180	$2,u$								2	18	<25
11 467.5	1.180	$0,u^+$								2	18	<25
11 467.7	1.182	$1,u$	1	1	0	2	0	7	1	2	17	38
11 469.5	1.196	$2,u$								1	17	<25
11 469.8	1.161	$0,g^+$	0	4	0	4	2	2	−2	4	18	44
		$0,g^+$	0	4	0	4	0	2	0	4	18	29
11 470.4	1.179	$0,g^+$								2	18	<25
11 470.7	1.193	$1,u$								1	18	<25
11 470.7	1.193	$1,g$								1	18	<25
11 471.0	1.161	$2,g$	0	4	0	4	4	2	−2	4	18	57
11 471.1	1.180	$0,u^-$	0	2	0	11	−1	1	1	2	18	31
11 472.6	1.180	$2,g$								2	18	<25
11 473.9	1.208	$1,u$								0	17	<25
11 474.1	1.168	$1,u$								3	18	<25
11 475.4	1.180	$2,u$								2	18	<25
11 476.5	1.179	$0,u^+$								2	18	<25
11 477.1	1.166	$1,g$	0	1	2	5	1	0	0	3	18	27
		$1,g$	1	2	0	7	1	0	0	3	18	28
11 477.2	1.196	$0,g^-$								1	17	<25
11 478.8	1.180	$0,g^-$	0	2	0	10	−2	2	2	2	18	31
11 481.5	1.178	$2,u$								2	18	<25
11 481.6	1.166	$1,g$	1	2	0	7	1	0	0	3	18	28
11 482.0	1.178	$1,g$	2	0	0	1	1	6	0	2	17	42
		$1,g$	2	0	0	1	−1	6	2	2	17	38
11 483.9	1.192	$1,g$								1	18	<25
11 483.9	1.192	$1,u$								1	18	<25
11 484.0	1.180	$2,g$								2	18	<25
11 484.2	1.169	$1,u$								3	18	<25
11 485.1	1.210	$1,u$								0	17	<25
11 485.1	1.180	$0,u^-$								2	18	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 485.4	1.194	$0,u^+$								1	17	<25
11 486.1	1.197	$0,g^+$								1	17	<25
11 487.7	1.196	2,*g*								1	17	<25
11 491.4	1.164	1,*u*	1	0	2	2	2	1	−1	3	18	36
11 491.6	1.184	1,*u*	0	1	1	1	1	8	0	2	17	35
		1,*u*	0	1	1	1	−1	8	2	2	17	36
11 491.8	1.180	$0,g^-$	1	0	1	7	−1	1	1	2	18	26
11 491.9	1.171	$0,g^+$	1	2	0	0	0	6	0	3	17	58
11 492.1	1.180	2,*u*								2	18	<25
11 492.5	1.208	$0,u^+$	0	0	0	11	1	7	−1	0	18	27
11 492.5	1.208	$0,g^+$								0	18	<25
11 493.6	1.166	1,*g*								3	18	<25
11 494.8	1.195	2,*u*								1	17	<25
11 495.4	1.167	1,*g*								3	18	<25
11 495.5	1.196	$0,u^-$	0	0	1	2	−2	10	2	1	17	33
11 496.2	1.180	2,*g*								2	18	<25
11 498.2	1.179	$0,u^+$	0	1	1	10	0	0	0	2	18	29
11 500.5	1.161	$0,g^-$	0	4	0	4	−2	2	2	4	18	89
11 500.6	1.197	2,*g*								1	17	<25
11 500.9	1.179	2,*u*	0	1	1	10	2	0	0	2	18	29
11 502.0	1.160	2,*g*	0	4	0	4	4	2	−2	4	18	30
11 502.9	1.171	1,*g*	0	3	0	7	1	2	0	3	18	40
11 503.1	1.181	$0,g^+$								2	18	<25
11 503.7	1.207	2,*u*								0	18	<25
11 503.7	1.207	2,*g*								0	18	<25
11 504.4	1.181	2,*g*								2	18	<25
11 505.3	1.167	1,*u*	1	0	2	2	0	1	1	3	18	31
11 505.5	1.171	2,*g*	1	2	0	0	0	6	2	3	17	60
11 507.4	1.157	$0,g^+$	1	3	0	4	0	0	0	4	18	67
11 507.9	1.194	$0,g^+$								1	17	<25
11 508.7	1.196	2,*u*								1	17	<25
11 509.7	1.168	1,*g*	0	2	1	6	0	1	1	3	18	35
11 510.9	1.179	$0,g^+$								2	18	<25
11 511.2	1.208	1,*g*								0	17	<25
11 512.4	1.166	1,*u*								3	18	<25
11 513.6	1.180	$0,u^+$								2	18	<25
11 514.1	1.158	2,*g*	1	3	0	4	2	0	0	4	18	52
11 514.2	1.195	2,*g*								1	17	<25
11 514.9	1.196	$0,u^-$								1	17	<25
11 515.6	1.179	$0,u^-$								2	18	<25
11 516.1	1.179	2,*g*	1	0	1	7	3	1	−1	2	18	29
11 516.5	1.196	$0,g^-$								1	17	<25
11 516.8	1.197	$0,g^+$	0	0	1	1	1	11	−1	1	17	38
11 516.8	1.179	$0,g^+$								2	18	<25
11 517.2	1.186	1,*g*	0	2	0	1	1	10	0	2	17	28
		1,*g*	0	2	0	1	−1	10	2	2	17	29
11 519.0	1.180	2,*u*								2	18	<25
11 519.2	1.168	1,*g*								3	18	<25
11 519.6	1.180	2,*g*								2	18	<25
11 520.8	1.179	2,*u*								2	18	<25
11 521.2	1.179	$0,u^+$								2	18	<25
11 522.1	1.151	1,*u*	0	5	0	2	2	1	−1	5	18	73
11 522.9	1.209	1,*g*								0	17	<25
11 523.5	1.180	2,*u*								2	18	<25
11 523.9	1.196	2,*u*								1	17	<25
11 527.1	1.197	$0,u^+$	0	1	0	1	1	13	−1	1	17	27
11 527.5	1.194	1,*u*								1	18	<25
11 527.5	1.194	1,*g*								1	18	<25
11 528.1	1.196	2,*g*								1	17	<25
11 528.2	1.179	2,*g*								2	18	<25
11 528.2	1.179	$0,g^+$								2	18	<25
11 529.4	1.209	1,*u*								0	17	<25
11 530.4	1.186	1,*u*	0	2	0	2	0	9	1	2	17	29
11 531.3	1.196	2,*g*	0	0	1	1	−1	11	3	1	17	27

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 532.5	1.167	1,u	1	2	0	6	2	1	−1	3	18	32
11 533.2	1.167	1,u								3	18	<25
11 535.4	1.181	0,g^-								2	18	<25
11 535.6	1.181	2,u								2	18	<25
11 535.9	1.181	0,u^+								2	18	<25
11 537.5	1.209	1,g								0	17	<25
11 538.4	1.192	1,g								1	18	<25
11 538.5	1.192	1,u								1	18	<25
11 540.3	1.195	0,g^-	1	0	0	2	−2	10	2	1	17	55
11 540.4	1.172	1,u	0	3	0	6	−2	3	3	3	18	32
11 540.7	1.192	1,u								1	18	<25
11 541.0	1.197	2,u								1	17	<25
11 541.3	1.161	0,g^+	0	4	0	4	2	2	−2	4	18	31
		0,g^+	0	4	0	4	0	2	0	4	18	58
11 541.4	1.175	0,g^+	0	3	0	0	0	8	0	3	17	74
11 542.1	1.193	1,g								1	18	<25
11 543.4	1.180	2,g								2	18	<25
11 544.4	1.151	1,u	0	5	0	2	2	1	−1	5	18	25
		1,u	0	5	0	2	0	1	1	5	18	74
11 544.7	1.157	0,g^+	0	2	2	2	0	0	0	4	18	46
11 544.8	1.170	1,g								3	18	<25
11 545.7	1.179	0,g^+								2	18	<25
11 546.1	1.183	1,g	1	1	0	1	1	8	0	2	17	35
		1,g	1	1	0	1	−1	8	2	2	17	38
11 546.9	1.157	2,g	0	2	2	2	2	0	0	4	18	45
11 548.4	1.161	2,g	0	4	0	4	2	2	0	4	18	37
		2,g	0	4	0	4	0	2	2	4	18	43
11 548.7	1.180	2,u	0	1	1	8	4	2	−2	2	18	26
11 549.3	1.181	0,u^-	0	1	1	8	−2	2	2	2	18	27
11 550.5	1.180	0,g^+								2	18	<25
11 550.8	1.180	2,g								2	18	<25
11 551.2	1.209	1,g								0	17	<25
11 552.7	1.192	1,u								1	18	<25
11 552.7	1.179	0,u^+								2	18	<25
11 552.8	1.195	2,g	1	0	0	2	2	10	0	1	17	27
		2,g	1	0	0	2	−2	10	4	1	17	25
11 552.9	1.170	1,g								3	18	<25
11 553.6	1.208	0,u^-								0	18	<25
11 553.6	1.208	0,g^-								0	18	<25
11 553.9	1.192	1,g								1	18	<25
11 554.0	1.179	0,g^-	1	0	1	7	−1	1	1	2	18	26
		0,g^-	0	1	1	9	−1	1	1	2	18	31
11 554.4	1.175	2,g	0	3	0	0	0	8	2	3	17	75
11 554.8	1.179	1,u	2	0	0	0	0	7	1	2	17	76
11 555.1	1.180	2,g								2	18	<25
11 555.6	1.185	1,g	0	1	1	0	0	9	1	2	17	77
11 555.7	1.179	2,g	0	0	2	6	2	2	0	2	18	28
11 556.1	1.210	1,u								0	17	<25
11 556.6	1.180	2,u								2	18	<25
11 556.9	1.180	0,g^+								2	18	<25
11 560.5	1.208	2,u								0	18	<25
11 560.5	1.208	2,g								0	18	<25
11 561.4	1.180	2,g								2	18	<25
11 561.9	1.180	0,u^+								2	18	<25
11 565.9	1.195	0,u^+	1	0	0	1	1	11	−1	1	17	39
11 566.0	1.180	2,u								2	18	<25
11 568.3	1.181	0,u^-								2	18	<25
11 568.9	1.168	1,u	1	2	0	6	0	1	1	3	18	35
11 569.1	1.181	0,g^+	0	2	0	8	4	4	−4	2	18	27
11 569.2	1.180	2,u								2	18	<25
11 569.4	1.169	1,u	0	2	1	5	3	2	−2	3	18	35
11 569.6	1.156	0,u^+	1	2	1	2	0	0	0	4	18	37
11 571.0	1.197	0,u^+								1	17	<25
11 572.9	1.169	1,g	1	1	1	4	0	1	1	3	18	28

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 573.2	1.180	2,*u*								2	18	<25
11 574.8	1.208	1,*u*								0	17	<25
11 575.0	1.194	0,u^-	1	0	0	1	−1	11	1	1	17	29
11 575.0	1.179	0,g^-								2	18	<25
11 575.6	1.195	2,*u*								1	17	<25
11 575.8	1.192	1,*g*								1	18	<25
11 575.9	1.179	0,u^+								2	18	<25
11 576.6	1.181	2,*g*								2	18	<25
11 579.1	1.181	0,u^+								2	18	<25
11 579.3	1.194	1,*u*								1	18	<25
11 580.3	1.196	2,*u*	1	0	0	1	1	11	1	1	17	30
11 580.3	1.156	2,*u*	1	2	1	2	2	0	0	4	18	60
11 580.8	1.157	2,*g*	0	2	2	2	2	0	0	4	18	29
		2,*g*	0	3	1	3	3	1	−1	4	18	60
11 581.0	1.194	1,*g*								1	18	<25
11 581.0	1.157	0,g^+	0	2	2	2	0	0	0	4	18	25
		0,g^+	0	3	1	3	1	1	−1	4	18	59
11 581.9	1.192	1,*u*								1	18	<25
11 581.9	1.197	0,g^+								1	17	<25
11 583.1	1.178	2,*g*	1	0	1	5	5	3	−3	2	18	32
11 583.9	1.179	0,u^-								2	18	<25
11 583.9	1.159	0,g^-	0	3	1	3	−1	1	1	4	18	89
11 585.3	1.193	1,*g*								1	18	<25
11 585.8	1.180	2,*u*								2	18	<25
11 585.9	1.159	0,u^+	0	4	0	3	3	3	−3	4	18	25
		0,u^+	0	4	0	3	1	3	−1	4	18	30
11 586.8	1.168	1,*u*								3	18	<25
11 587.6	1.180	2,*g*	0	1	1	7	5	3	−3	2	18	32
11 588.4	1.180	0,g^-	1	1	0	8	−2	2	2	2	18	30
11 589.2	1.192	1,*u*								1	18	<25
11 589.7	1.195	2,*u*								1	17	<25
11 590.1	1.192	1,*g*								1	18	<25
11 590.5	1.179	2,*u*								2	18	<25
11 590.5	1.169	1,*g*								3	18	<25
11 590.7	1.209	1,*u*	0	0	0	2	−2	15	3	0	17	28
11 590.8	1.192	1,*u*								1	18	<25
11 590.9	1.163	1,*u*	2	0	1	3	1	0	0	3	18	44
11 591.2	1.207	0,u^+								0	18	<25
11 591.2	1.207	0,g^+								0	18	<25
11 591.7	1.197	2,*g*								1	17	<25
11 592.4	1.159	2,*g*	0	3	1	3	1	1	1	4	18	81
11 592.4	1.171	1,*g*								3	18	<25
11 594.4	1.179	0,g^+								2	18	<25
11 595.6	1.180	2,*g*								2	18	<25
11 596.3	1.180	2,*u*								2	18	<25
11 597.1	1.179	0,u^-	1	0	1	6	−2	2	2	2	18	35
11 598.3	1.167	1,*u*								3	18	<25
11 599.2	1.207	2,*u*								0	18	<25
11 599.2	1.207	2,*g*								0	18	<25
11 599.6	1.182	0,g^+								2	18	<25
11 600.0	1.162	0,u^-	0	4	0	3	−3	3	3	4	18	72
11 600.4	1.154	0,u^+	0	1	3	0	0	0	0	4	18	46
11 600.8	1.197	0,g^-								1	17	<25
11 601.0	1.181	2,*u*								2	18	<25
11 601.5	1.181	0,u^+								2	18	<25
11 602.4	1.168	1,*g*	1	2	0	5	3	2	−2	3	18	36
11 602.6	1.172	1,*u*	0	3	0	6	2	3	−1	3	18	26
11 602.7	1.160	2,*u*	0	4	0	3	3	3	−1	4	18	29
11 605.4	1.179	0,g^+								2	18	<25
11 605.6	1.168	1,*g*								3	18	<25
11 606.2	1.171	1,*u*								3	18	<25
11 606.6	1.181	0,u^-								2	18	<25
11 606.7	1.187	1,*g*	0	2	0	1	1	10	0	2	17	38
		1,*g*	0	2	0	1	−1	10	2	2	17	37

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 607.2	1.193	1,u								1	18	<25
11 608.1	1.181	0,g^-								2	18	<25
11 609.4	1.184	1,u	1	1	0	0	0	9	1	2	17	63
11 609.9	1.193	1,g								1	18	<25
11 610.6	1.178	2,g	2	0	0	8	2	0	0	2	18	31
11 612.2	1.180	2,g								2	18	<25
11 612.2	1.152	0,g^+	1	1	2	0	0	0	0	4	18	84
11 612.4	1.197	2,g								1	17	<25
11 612.5	1.211	1,g	0	0	0	1	1	16	0	0	17	32
11 613.5	1.193	1,u	0	0	1	7	7	6	−6	1	18	26
11 614.0	1.164	1,g	2	1	0	5	1	0	0	3	18	36
11 614.0	1.177	0,g^+	2	0	0	8	0	0	0	2	18	34
11 614.2	1.181	2,u								2	18	<25
11 614.3	1.182	0,u^+								2	18	<25
11 614.8	1.192	1,g								1	18	<25
11 615.0	1.165	1,u								3	18	<25
11 615.7	1.181	2,g								2	18	<25
11 616.1	1.198	0,u^+	0	1	0	1	1	13	−1	1	17	26
11 617.3	1.193	1,u								1	18	<25
11 617.6	1.180	2,g								2	18	<25
11 618.1	1.208	0,u^+								0	18	<25
11 618.1	1.208	0,g^+								0	18	<25
11 619.3	1.181	0,g^-								2	18	<25
11 619.7	1.166	1,g								3	18	<25
11 619.8	1.193	1,g								1	18	<25
11 620.0	1.179	0,u^+								2	18	<25
11 620.1	1.165	1,u	0	0	3	1	1	2	0	3	18	32
11 621.0	1.181	2,u								2	18	<25
11 621.2	1.159	0,u^+	1	3	0	3	1	1	−1	4	18	47
		0,u^+	0	4	0	3	3	3	−3	4	18	28
11 621.4	1.182	0,g^-								2	18	<25
11 622.1	1.167	1,g	1	0	2	1	−1	2	2	3	18	27
11 622.6	1.140	0,g^+	0	6	0	0	0	0	0	6	18	100
11 622.9	1.158	2,u	1	3	0	3	3	1	−1	4	18	66
11 625.3	1.147	1,u	0	4	1	1	1	0	0	5	18	97
11 625.4	1.193	1,u								1	18	<25
11 626.3	1.192	1,u								1	18	<25
11 626.4	1.180	2,g								2	18	<25
11 627.5	1.193	1,g								1	18	<25
11 627.8	1.198	2,u								1	17	<25
11 628.0	1.193	1,g								1	18	<25
11 628.4	1.181	0,u^-	1	1	0	7	−3	3	3	2	18	41
11 629.3	1.208	2,g								0	18	<25
11 629.3	1.208	2,u								0	18	<25
11 629.7	1.179	2,u								2	18	<25
11 630.1	1.168	1,g	1	2	0	5	−1	2	2	3	18	31
11 630.2	1.197	0,g^-	0	0	1	1	−1	11	1	1	17	28
11 631.2	1.161	0,u^+	0	4	0	3	3	3	−3	4	18	26
		0,u^+	0	4	0	3	1	3	−1	4	18	45
11 631.6	1.181	0,g^+								2	18	<25
11 631.8	1.195	0,g^+	1	0	0	0	0	12	0	1	17	32
11 632.3	1.179	0,u^+								2	18	<25
11 632.4	1.180	2,u								2	18	<25
11 632.4	1.181	0,u^-								2	18	<25
11 633.4	1.168	1,u	1	1	1	3	3	2	−2	3	18	34
11 633.6	1.160	2,u	1	3	0	3	1	1	1	4	18	31
		2,u	0	4	0	3	3	3	−1	4	18	41
11 634.3	1.179	2,u								2	18	<25
11 634.6	1.158	0,u^-	1	3	0	3	−1	1	1	4	18	80
11 634.8	1.181	2,u								2	18	<25
11 635.0	1.194	1,u								1	18	<25
11 635.8	1.209	1,g								0	17	<25
11 636.9	1.180	0,g^+								2	18	<25
11 637.1	1.197	2,g								1	17	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 638.3	1.207	$0,u^-$								0	18	<25
11 638.3	1.207	$0,g^-$								0	18	<25
11 638.4	1.178	$0,u^+$	2	0	0	7	1	1	−1	2	18	31
11 640.8	1.181	$2,g$								2	18	<25
11 641.3	1.193	$1,g$								1	18	<25
11 641.3	1.197	$0,u^+$	0	0	1	0	0	12	0	1	17	32
11 641.4	1.207	$2,u$								0	18	<25
11 641.4	1.207	$2,g$								0	18	<25
11 641.6	1.167	$1,g$								3	18	<25
11 642.8	1.180	$2,u$								2	18	<25
11 645.8	1.180	$2,g$								2	18	<25
11 646.0	1.160	$2,u$	1	3	0	3	1	1	1	4	18	47
		$2,u$	0	4	0	3	−1	3	3	4	18	30
11 646.2	1.171	$1,u$								3	18	<25
11 646.5	1.179	$2,u$								2	18	<25
11 646.5	1.198	$0,u^-$	0	1	0	1	−1	13	1	1	17	40
11 646.7	1.196	$2,g$								1	17	<25
11 646.7	1.172	$1,g$								3	18	<25
11 646.9	1.194	$1,u$								1	18	<25
11 647.5	1.193	$1,g$								1	18	<25
11 647.9	1.182	$0,g^+$	0	2	0	6	6	6	−6	2	18	25
11 650.2	1.194	$1,g$								1	18	<25
11 650.8	1.180	$2,g$								2	18	<25
11 650.9	1.181	$0,g^-$								2	18	<25
11 652.1	1.179	$0,u^-$	1	0	1	4	−4	4	4	2	18	32
11 652.5	1.198	$2,u$	0	0	1	0	0	12	2	1	17	31
11 653.5	1.170	$1,g$	0	2	1	4	4	3	−3	3	18	42
11 654.2	1.180	$0,u^+$								2	18	<25
11 654.4	1.180	$0,g^-$	0	0	2	4	−4	4	4	2	18	40
11 654.9	1.193	$1,u$								1	18	<25
11 656.5	1.182	$0,u^-$								2	18	<25
11 656.9	1.181	$2,g$								2	18	<25
11 658.4	1.198	$2,u$								1	17	<25
11 660.1	1.180	$0,g^+$								2	18	<25
11 660.2	1.181	$2,g$	1	1	0	6	6	4	−4	2	18	34
11 660.7	1.194	$1,u$								1	18	<25
11 661.9	1.192	$1,u$								1	18	<25
11 662.0	1.158	$0,u^+$	0	2	2	1	1	1	−1	4	18	46
11 662.7	1.194	$1,g$								1	18	<25
11 663.0	1.182	$0,g^+$								2	18	<25
11 663.7	1.182	$2,u$								2	18	<25
11 664.1	1.171	$1,u$								3	18	<25
11 664.9	1.180	$0,u^-$								2	18	<25
11 665.5	1.188	$1,u$	0	2	0	0	0	11	1	2	17	72
11 666.4	1.192	$1,u$								1	18	<25
11 666.5	1.192	$1,g$								1	18	<25
11 666.7	1.180	$2,g$								2	18	<25
11 667.9	1.168	$1,g$	1	2	0	5	1	2	0	3	18	31
11 667.9	1.181	$0,u^+$								2	18	<25
11 668.1	1.182	$0,g^-$								2	18	<25
11 669.7	1.207	$2,g$	0	0	0	10	10	8	−8	0	18	28
11 669.7	1.207	$2,u$								0	18	<25
11 670.2	1.181	$2,u$								2	18	<25
11 670.3	1.162	$0,u^-$	0	4	0	3	−1	3	1	4	18	83
11 670.8	1.169	$1,g$								3	18	<25
11 670.8	1.207	$0,u^+$								0	18	<25
11 670.8	1.207	$0,g^+$								0	18	<25
11 671.8	1.178	$2,u$								2	18	<25
11 671.9	1.193	$1,g$								1	18	<25
11 673.4	1.209	$1,u$								0	17	<25
11 674.8	1.180	$0,u^+$	1	0	1	4	4	4	−4	2	18	43
11 674.8	1.177	$0,u^-$	2	0	0	7	−1	1	1	2	18	38
11 674.9	1.209	$1,g$								0	17	<25
11 675.3	1.169	$1,u$								3	18	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 675.6	1.158	$0,u^-$	0	2	2	1	−1	1	1	4	18	47
		$0,u^-$	0	3	1	2	−2	2	2	4	18	29
11 676.0	1.148	$1,g$	1	4	0	1	1	0	0	5	18	66
11 676.3	1.181	$2,u$								2	18	<25
11 676.4	1.197	$0,g^+$	0	1	0	0	0	14	0	1	17	33
11 676.4	1.180	$0,g^+$	0	0	2	4	4	4	−4	2	18	27
11 676.9	1.164	$1,g$	2	0	1	2	2	1	−1	3	18	36
11 677.3	1.182	$2,g$								2	18	<25
11 678.1	1.178	$2,g$	2	0	0	6	4	2	−2	2	18	40
11 678.6	1.162	$2,u$	0	4	0	3	1	3	1	4	18	58
11 679.7	1.194	$1,u$								1	18	<25
11 680.4	1.193	$1,g$								1	18	<25
11 680.7	1.211	$1,u$	0	0	0	0	0	17	1	0	17	39
11 680.8	1.180	$2,g$								2	18	<25
11 680.8	1.182	$0,g^-$	1	1	0	6	−4	4	4	2	18	45
11 681.9	1.178	$2,u$								2	18	<25
11 682.1	1.193	$1,u$								1	18	<25
11 683.4	1.158	$2,u$	0	2	2	1	1	1	1	4	18	45
11 685.0	1.167	$1,u$	2	1	0	4	2	1	−1	3	18	32
11 685.3	1.182	$0,u^+$								2	18	<25
11 685.4	1.178	$0,g^+$	2	0	0	6	2	2	−2	2	18	33
11 685.8	1.193	$1,u$								1	18	<25
11 686.7	1.208	$2,g$	0	0	0	10	10	8	−8	0	18	36
11 687.6	1.194	$1,g$								1	18	<25
11 688.2	1.196	$0,u^-$	1	0	0	1	−1	11	1	1	17	42
11 688.9	1.192	$1,g$								1	18	<25
11 689.2	1.208	$0,u^-$								0	18	<25
11 689.2	1.208	$0,g^-$								0	18	<25
11 689.4	1.198	$2,g$	0	1	0	0	0	14	2	1	17	33
11 689.5	1.169	$1,u$	1	2	0	4	4	3	−3	3	18	30
11 689.6	1.150	$1,g$	1	4	0	1	1	0	0	5	18	29
		$1,g$	0	5	0	1	−1	2	2	5	18	50
11 689.6	1.181	$2,g$								2	18	<25
11 689.9	1.208	$2,u$								0	18	<25
11 690.7	1.170	$1,g$	0	2	1	4	2	3	−1	3	18	26
		$1,g$	0	2	1	4	−2	3	3	3	18	25
11 691.7	1.193	$1,u$								1	18	<25
11 692.9	1.157	$0,g^+$	1	2	1	1	1	1	−1	4	18	50
11 694.0	1.194	$1,g$								1	18	<25
11 696.2	1.208	$2,g$								0	18	<25
11 696.6	1.172	$1,u$								3	18	<25
11 697.7	1.181	$0,u^+$								2	18	<25
11 698.0	1.183	$0,g^-$								2	18	<25
11 698.3	1.183	$2,u$								2	18	<25
11 698.5	1.163	$1,g$	2	0	1	2	0	1	1	3	18	36
11 698.7	1.182	$0,g^+$								2	18	<25
11 699.6	1.207	$0,g^+$								0	18	<25
11 699.7	1.207	$0,u^+$								0	18	<25
11 700.0	1.196	$2,u$								1	17	<25
11 701.0	1.208	$2,u$								0	18	<25
11 701.8	1.207	$0,u^-$	0	0	0	9	−7	9	7	0	18	25
11 701.9	1.207	$0,g^-$								0	18	<25
11 702.3	1.183	$0,u^+$								2	18	<25
11 702.5	1.194	$1,u$	0	0	1	7	7	6	−6	1	18	26
11 702.5	1.180	$0,u^-$	1	0	1	4	−4	4	4	2	18	32
11 702.9	1.181	$2,u$								2	18	<25
11 703.1	1.182	$2,g$								2	18	<25
11 703.7	1.194	$1,g$								1	18	<25
11 704.0	1.209	$1,u$								0	17	<25
11 705.2	1.169	$1,u$								3	18	<25
11 705.3	1.210	$1,g$								0	17	<25
11 705.9	1.178	$0,g^-$	2	0	0	6	−2	2	2	2	18	53
11 706.4	1.151	$1,g$	0	5	0	1	1	2	0	5	18	57
		$1,g$	0	5	0	1	−1	2	2	5	18	39

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 706.4	1.158	$0,u^+$	0	2	2	1	1	1	−1	4	18	37
		$0,u^+$	0	3	1	2	2	2	−2	4	18	34
11 706.5	1.193	$1,g$								1	18	<25
11 707.1	1.194	$1,u$								1	18	<25
11 707.3	1.180	$2,u$								2	18	<25
11 707.9	1.183	$2,g$								2	18	<25
11 708.3	1.173	$1,g$	0	3	0	5	1	4	0	3	18	31
11 708.4	1.207	$2,g$								0	18	<25
11 708.7	1.181	$0,g^+$								2	18	<25
11 710.7	1.182	$2,u$								2	18	<25
11 710.7	1.169	$1,u$								3	18	<25
11 710.9	1.182	$0,g^+$	1	1	0	6	4	4	−4	2	18	31
11 711.4	1.156	$2,g$	1	2	1	1	1	1	1	4	18	45
11 711.7	1.158	$0,u^-$	0	2	2	1	−1	1	1	4	18	36
		$0,u^-$	0	3	1	2	−2	2	2	4	18	54
11 711.9	1.169	$1,g$								3	18	<25
11 712.1	1.194	$1,u$								1	18	<25
11 713.2	1.207	$2,u$								0	18	<25
11 713.6	1.194	$1,g$								1	18	<25
11 713.8	1.168	$1,u$	2	1	0	4	0	1	1	3	18	31
11 713.8	1.198	$0,g^+$	1	0	0	0	0	12	0	1	17	29
		$0,g^+$	0	1	0	0	0	14	0	1	17	31
11 713.9	1.179	$0,u^+$								2	18	<25
11 714.3	1.170	$1,g$	0	2	1	4	0	3	1	3	18	30
11 714.3	1.160	$0,u^+$	0	3	1	2	2	2	−2	4	18	30
		$0,u^+$	0	3	1	2	0	2	0	4	18	61
11 714.6	1.182	$0,u^-$								2	18	<25
11 714.9	1.178	$2,g$								2	18	<25
11 715.1	1.156	$0,g^-$	1	2	1	1	−1	1	1	4	18	71
11 716.6	1.181	$2,g$								2	18	<25
11 716.8	1.158	$2,u$	0	2	2	1	1	1	1	4	18	27
		$2,u$	0	3	1	2	2	2	0	4	18	62
11 717.4	1.195	$1,g$								1	18	<25
11 717.4	1.207	$2,g$								0	18	<25
11 717.6	1.193	$1,u$								1	18	<25
11 717.9	1.180	$0,g^-$	1	0	1	5	−1	3	1	2	18	31
11 717.9	1.181	$0,g^+$								2	18	<25
11 718.4	1.195	$1,u$								1	18	<25
11 720.2	1.181	$2,g$								2	18	<25
11 721.1	1.178	$2,u$	2	0	0	5	5	3	−3	2	18	35
11 721.1	1.168	$1,u$								3	18	<25
11 721.5	1.207	$0,g^+$	0	0	0	10	8	8	−8	0	18	30
11 721.6	1.207	$0,u^+$								0	18	<25
11 722.5	1.195	$1,g$								1	18	<25
11 722.7	1.181	$0,g^+$	0	0	2	4	0	4	0	2	18	27
11 722.8	1.160	$0,g^+$	0	4	0	2	2	4	−2	4	18	31
11 724.0	1.182	$0,g^-$	0	1	1	5	−5	5	5	2	18	35
11 724.4	1.181	$2,g$								2	18	<25
11 724.6	1.182	$0,u^-$								2	18	<25
11 725.8	1.198	$2,g$	1	0	0	0	0	12	2	1	17	30
		$2,g$	0	1	0	0	0	14	2	1	17	29
11 726.6	1.194	$1,g$								1	18	<25
11 726.6	1.159	$2,u$	0	3	1	2	0	2	2	4	18	74
11 726.6	1.207	$2,u$								0	18	<25
11 727.5	1.193	$1,u$								1	18	<25
11 728.1	1.182	$2,u$								2	18	<25
11 729.3	1.194	$1,u$								1	18	<25
11 730.8	1.182	$2,g$								2	18	<25
11 730.9	1.169	$1,u$	1	2	0	4	2	3	−1	3	18	25
		$1,u$	1	2	0	4	−2	3	3	3	18	26
11 731.9	1.181	$2,u$								2	18	<25
11 732.8	1.193	$1,g$								1	18	<25
11 734.4	1.154	$0,g^+$	2	2	0	2	0	0	0	4	18	69
11 734.9	1.207	$0,g^-$	0	0	0	12	−6	6	6	0	18	28

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 735.2	1.157	2,*g*	2	2	0	2	2	0	0	4	18	46
11 735.7	1.164	1,*g*	0	0	3	0	0	3	1	3	18	44
11 736.1	1.207	0,u^-								0	18	<25
11 736.2	1.193	1,*u*								1	18	<25
11 736.3	1.168	1,*u*								3	18	<25
11 736.5	1.181	2,*g*								2	18	<25
11 737.3	1.182	0,u^+								2	18	<25
11 737.8	1.181	2,*u*								2	18	<25
11 739.8	1.207	2,*g*								0	18	<25
11 740.0	1.162	1,*g*	3	0	0	3	1	0	0	3	18	55
11 741.2	1.181	0,u^-								2	18	<25
11 741.8	1.206	0,g^+								0	18	<25
11 742.2	1.194	1,*g*								1	18	<25
11 743.0	1.157	2,*g*	1	2	1	1	1	1	1	4	18	40
11 743.0	1.179	0,u^-	2	0	0	5	−3	3	3	2	18	28
11 743.1	1.181	0,u^+								2	18	<25
11 743.8	1.181	0,g^+								2	18	<25
11 744.4	1.168	1,*g*	1	1	1	2	−2	3	3	3	18	38
11 744.4	1.183	0,g^+								2	18	<25
11 745.7	1.159	0,g^-	1	3	0	2	−2	2	2	4	18	43
		0,g^-	0	4	0	2	−2	4	2	4	18	28
11 745.8	1.181	2,*u*								2	18	<25
11 747.0	1.194	1,*g*								1	18	<25
11 748.5	1.167	1,*u*	1	0	2	0	0	3	1	3	18	45
11 748.7	1.208	0,u^+	0	0	0	9	9	9	−9	0	18	59
11 748.7	1.179	0,u^+								2	18	<25
11 750.2	1.159	0,g^+	1	3	0	2	2	2	−2	4	18	51
11 750.4	1.208	0,u^-	0	0	0	9	−9	9	9	0	18	49
		0,u^-	0	0	0	11	−7	7	7	0	18	25
11 750.5	1.210	1,*g*								0	17	<25
11 750.9	1.178	0,g^+								2	18	<25
11 751.7	1.193	1,*g*								1	18	<25
11 752.4	1.209	0,g^+								0	18	<25
11 752.4	1.182	0,g^-								2	18	<25
11 752.5	1.181	2,*u*								2	18	<25
11 752.6	1.209	0,u^+								0	18	<25
11 752.6	1.182	0,u^+								2	18	<25
11 752.7	1.182	2,*g*								2	18	<25
11 753.0	1.181	2,*g*								2	18	<25
11 753.4	1.182	0,u^-	1	1	0	5	−5	5	5	2	18	33
11 753.6	1.194	1,*u*								1	18	<25
11 753.8	1.207	2,*u*								0	18	<25
11 754.9	1.182	2,*u*								2	18	<25
11 754.9	1.173	1,*u*	0	3	0	4	−2	5	3	3	18	27
11 755.3	1.194	1,*u*								1	18	<25
11 756.6	1.178	2,*g*								2	18	<25
11 758.0	1.180	0,g^-	1	0	1	3	−3	5	3	2	18	38
11 758.8	1.211	1,*u*	0	0	0	0	0	17	1	0	17	40
11 759.5	1.161	2,*g*	1	3	0	2	2	2	0	4	18	46
		2,*g*	0	4	0	2	−2	4	4	4	18	34
11 759.5	1.172	1,*g*								3	18	<25
11 761.5	1.170	1,*u*								3	18	<25
11 761.8	1.208	2,*g*								0	18	<25
11 762.2	1.193	1,*u*								1	18	<25
11 762.8	1.194	1,*g*								1	18	<25
11 763.7	1.182	2,*u*								2	18	<25
11 764.0	1.208	2,*u*								0	18	<25
11 764.3	1.182	2,*g*								2	18	<25
11 765.8	1.159	0,g^+	1	3	0	2	0	2	0	4	18	60
11 766.3	1.182	0,u^+	1	1	0	5	5	5	−5	2	18	35
11 766.4	1.162	0,g^-	1	3	0	2	−2	2	2	4	18	32
		0,g^-	0	4	0	2	−2	4	2	4	18	62
11 767.7	1.180	0,u^-	1	0	1	4	−2	4	2	2	18	27
11 768.7	1.194	1,*g*								1	18	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 769.2	1.181	2,*u*								2	18	<25
11 769.3	1.208	2,*g*								0	18	<25
11 769.4	1.208	0,g^-								0	18	<25
11 769.9	1.208	0,u^-								0	18	<25
11 770.4	1.179	2,*u*								2	18	<25
11 770.8	1.208	2,*u*								0	18	<25
11 771.4	1.169	1,*u*	1	2	0	4	0	3	1	3	18	34
11 771.8	1.160	2,*g*	1	3	0	2	0	2	2	4	18	48
		2,*g*	0	4	0	2	2	4	0	4	18	33
11 771.8	1.199	0,u^-	0	1	0	1	−1	13	1	1	17	31
		0,u^-	0	1	0	3	−1	11	1	1	17	34
11 773.9	1.180	2,*g*								2	18	<25
11 775.0	1.166	1,*g*	2	1	0	3	3	2	−2	3	18	49
11 775.7	1.194	1,*u*								1	18	<25
11 775.9	1.207	2,*g*								0	18	<25
11 776.0	1.171	1,*u*	0	2	1	3	−3	4	4	3	18	31
11 776.0	1.199	0,g^+								1	17	<25
11 776.6	1.183	0,g^+								2	18	<25
11 777.6	1.207	2,*u*								0	18	<25
11 778.9	1.182	0,g^-								2	18	<25
11 779.1	1.195	1,*g*								1	18	<25
11 780.1	1.182	2,*u*								2	18	<25
11 780.3	1.161	2,*g*	1	3	0	2	2	2	0	4	18	26
		2,*g*	1	3	0	2	0	2	2	4	18	28
		2,*g*	0	4	0	2	−2	4	4	4	18	31
11 781.4	1.195	1,*u*								1	18	<25
11 781.8	1.167	1,*g*								3	18	<25
11 782.2	1.199	2,*u*								1	17	<25
11 782.2	1.207	0,u^+								0	18	<25
11 782.2	1.207	0,g^+								0	18	<25
11 783.0	1.152	0,u^+	2	1	1	0	0	0	0	4	18	64
		0,u^+	0	1	3	0	0	0	0	4	18	32
11 783.1	1.181	0,u^+								2	18	<25
11 785.1	1.181	0,u^+								2	18	<25
11 785.5	1.194	1,*u*								1	18	<25
11 785.7	1.195	1,*g*								1	18	<25
11 785.9	1.164	1,*u*	2	0	1	1	1	2	0	3	18	26
11 786.8	1.182	2,*g*								2	18	<25
11 786.9	1.199	2,*g*								1	17	<25
11 788.5	1.194	1,*g*								1	18	<25
11 788.6	1.194	1,*g*								1	18	<25
11 788.9	1.180	0,g^+								2	18	<25
11 789.1	1.207	2,*g*								0	18	<25
11 789.4	1.183	0,u^-								2	18	<25
11 789.9	1.182	2,*u*								2	18	<25
11 790.8	1.195	1,*u*								1	18	<25
11 790.8	1.148	1,*g*	0	4	1	0	0	1	1	5	18	97
11 791.6	1.183	2,*g*								2	18	<25
11 792.2	1.194	1,*g*								1	18	<25
11 793.2	1.170	1,*g*								3	18	<25
11 794.3	1.194	1,*u*								1	18	<25
11 794.9	1.184	0,g^-								2	18	<25
11 795.0	1.194	1,*g*								1	18	<25
11 796.5	1.171	1,*u*								3	18	<25
11 796.7	1.182	0,u^+								2	18	<25
11 796.9	1.183	0,u^-								2	18	<25
11 797.1	1.180	2,*u*								2	18	<25
11 797.4	1.169	1,*g*								3	18	<25
11 800.0	1.208	2,*u*	0	0	0	9	−7	9	9	0	18	26
11 800.7	1.181	0,g^+								2	18	<25
11 801.4	1.182	2,*u*								2	18	<25
11 802.6	1.195	1,*g*								1	18	<25
11 802.6	1.180	0,u^+								2	18	<25
11 802.9	1.183	2,*g*								2	18	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 803.1	1.171	1,g								3	18	<25
11 803.3	1.194	1,u								1	18	<25
11 803.4	1.163	0,g^+	0	4	0	2	2	4	−2	4	18	28
		0,g^+	0	4	0	2	0	4	0	4	18	57
11 804.6	1.181	2,u								2	18	<25
11 804.6	1.181	2,g								2	18	<25
11 804.7	1.164	1,u	2	0	1	1	−1	2	2	3	18	33
11 806.9	1.194	1,u								1	18	<25
11 807.3	1.182	2,u								2	18	<25
11 807.8	1.207	2,u								0	18	<25
11 808.8	1.159	0,g^+	0	2	2	0	0	2	0	4	18	41
		0,g^+	0	3	1	1	1	3	−1	4	18	36
11 810.2	1.207	0,g^+								0	18	<25
11 810.2	1.178	0,g^-	2	0	0	4	−4	4	4	2	18	60
11 810.2	1.180	0,g^+	1	0	1	3	3	5	−3	2	18	26
11 810.4	1.194	1,u								1	18	<25
11 810.8	1.182	0,u^-								2	18	<25
11 813.1	1.163	2,g	0	4	0	2	2	4	0	4	18	29
		2,g	0	4	0	2	0	4	2	4	18	55
11 813.2	1.181	2,g								2	18	<25
11 813.4	1.183	2,u								2	18	<25
11 814.1	1.208	0,u^+								0	18	<25
11 814.4	1.195	1,u								1	18	<25
11 816.0	1.207	2,g								0	18	<25
11 816.2	1.174	1,u	0	3	0	4	2	5	−1	3	18	25
		1,u	0	3	0	4	0	5	1	3	18	26
11 819.5	1.166	1,g	2	1	0	3	1	2	0	3	18	35
		1,g	2	1	0	3	−1	2	2	3	18	33
11 819.6	1.194	1,g								1	18	<25
11 819.9	1.180	2,g								2	18	<25
11 820.9	1.179	0,g^+	2	0	0	4	4	4	−4	2	18	43
11 821.1	1.208	0,g^-								0	18	<25
11 821.6	1.181	0,u^+	0	0	2	3	1	5	−1	2	18	29
11 821.7	1.208	0,u^-	0	0	0	13	−5	5	5	0	18	25
11 822.1	1.172	1,u	0	2	1	3	1	4	0	3	18	25
		1,u	0	2	1	3	−1	4	2	3	18	25
11 822.2	1.172	1,g	1	2	0	3	−3	4	4	3	18	31
11 823.2	1.183	0,u^-	0	1	1	4	−4	6	4	2	18	32
11 823.3	1.182	2,u								2	18	<25
11 823.4	1.159	2,g	0	2	2	0	0	2	2	4	18	46
11 826.3	1.181	0,g^+								2	18	<25
11 826.4	1.170	1,g								3	18	<25
11 827.3	1.195	1,g								1	18	<25
11 827.7	1.184	0,g^-								2	18	<25
11 827.8	1.208	2,u								0	18	<25
11 830.8	1.195	1,u								1	18	<25
11 831.2	1.208	0,g^+	0	0	0	8	8	10	−8	0	18	34
11 831.3	1.180	0,u^-	2	0	0	5	−1	3	1	2	18	33
11 831.5	1.209	2,g								0	18	<25
11 831.6	1.162	1,u	3	0	0	2	2	1	−1	3	18	63
11 832.4	1.208	2,g								0	18	<25
11 832.6	1.181	2,g								2	18	<25
11 833.5	1.208	2,u								0	18	<25
11 833.5	1.209	0,u^-								0	18	<25
11 833.6	1.184	0,g^+								2	18	<25
11 833.7	1.206	0,u^+	0	0	0	17	1	1	−1	0	18	26
11 833.8	1.209	0,g^-								0	18	<25
11 833.9	1.171	1,g								3	18	<25
11 834.4	1.180	2,g								2	18	<25
11 834.8	1.181	0,u^-								2	18	<25
11 835.6	1.195	1,g								1	18	<25
11 836.2	1.181	2,u								2	18	<25
11 836.7	1.156	0,u^+	2	2	0	1	1	1	−1	4	18	29
		0,u^+	1	2	1	0	0	2	0	4	18	31

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 837.3	1.183	2,*u*								2	18	<25
11 837.8	1.181	0,g^-								2	18	<25
11 838.4	1.195	1,*u*								1	18	<25
11 838.7	1.183	0,u^+								2	18	<25
11 838.9	1.168	1,*u*								3	18	<25
11 840.3	1.209	1,*u*								0	17	<25
11 840.3	1.209	1,*g*								0	17	<25
11 841.2	1.181	2,*u*								2	18	<25
11 843.1	1.179	2,*u*								2	18	<25
11 843.3	1.207	2,*g*								0	18	<25
11 843.8	1.148	1,*u*	1	4	0	0	0	1	1	5	18	85
11 843.9	1.183	2,*g*								2	18	<25
11 844.3	1.159	0,g^+	0	2	2	0	0	2	0	4	18	42
		0,g^+	0	3	1	1	1	3	−1	4	18	47
11 847.3	1.182	2,*g*								2	18	<25
11 847.4	1.160	0,g^-	0	3	1	1	−1	3	1	4	18	93
11 847.7	1.179	0,g^+	1	0	1	3	1	5	−1	2	18	28
11 847.8	1.161	1,*u*	3	0	0	2	0	1	1	3	18	72
11 848.1	1.207	0,g^-								0	18	<25
11 849.2	1.183	2,*g*								2	18	<25
11 849.5	1.195	1,*u*								1	18	<25
11 851.0	1.170	1,*g*	0	1	2	1	−1	4	2	3	18	26
11 852.3	1.183	2,*u*								2	18	<25
11 853.3	1.157	2,*u*	2	2	0	1	1	1	1	4	18	27
		2,*u*	1	2	1	0	0	2	2	4	18	40
11 854.4	1.182	0,g^-	0	0	2	2	−2	6	2	2	18	27
11 855.2	1.160	2,*g*	0	3	1	1	1	3	1	4	18	70
11 855.3	1.208	2,*u*								0	18	<25
11 856.4	1.195	1,*g*								1	18	<25
11 857.3	1.194	1,*u*								1	18	<25
11 857.8	1.180	2,*g*								2	18	<25
11 858.1	1.195	1,*g*								1	18	<25
11 858.5	1.205	0,g^+	0	0	0	16	2	2	−2	0	18	29
11 859.6	1.196	1,*g*								1	18	<25
11 860.1	1.194	1,*u*								1	18	<25
11 860.1	1.183	0,u^+	0	1	1	4	4	6	−4	2	18	26
11 860.4	1.208	2,*g*								0	18	<25
11 861.5	1.155	0,u^-	2	2	0	1	−1	1	1	4	18	82
11 863.2	1.208	0,u^+								0	18	<25
11 863.7	1.174	1,*g*								3	18	<25
11 863.9	1.156	0,u^+	2	2	0	1	1	1	−1	4	18	56
11 864.0	1.160	2,*g*	0	3	1	1	−1	3	3	4	18	64
11 865.6	1.179	0,g^-	2	0	0	4	−2	4	2	2	18	41
11 865.7	1.196	1,*u*								1	18	<25
11 866.1	1.195	1,*g*								1	18	<25
11 866.8	1.206	0,u^-	0	0	0	17	−1	1	1	0	18	26
11 868.0	1.207	2,*u*								0	18	<25
11 868.8	1.196	1,*u*								1	18	<25
11 868.9	1.206	2,*g*								0	18	<25
11 869.4	1.182	2,*g*								2	18	<25
11 869.9	1.184	0,g^-	0	2	0	4	−4	8	4	2	18	30
11 870.0	1.183	2,*u*								2	18	<25
11 870.8	1.208	0,g^+								0	18	<25
11 871.5	1.194	1,*g*								1	18	<25
11 873.2	1.183	0,g^+	1	1	0	4	4	6	−4	2	18	31
11 873.9	1.160	0,u^+	1	2	1	0	0	2	0	4	18	42
		0,u^+	0	4	0	1	1	5	−1	4	18	32
11 874.2	1.152	1,*u*	0	5	0	0	0	3	1	5	18	85
11 876.0	1.180	2,*g*								2	18	<25
11 876.1	1.180	0,u^-	1	0	1	2	−2	6	2	2	18	49
11 876.2	1.171	1,*g*	0	2	1	2	0	5	1	3	18	25
11 876.4	1.209	1,*g*								0	17	<25
11 876.7	1.210	1,*u*								0	17	<25
11 876.9	1.170	1,*g*	1	2	0	3	1	4	0	3	18	35

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		1,g	1	2	0	3	−1	4	2	3	18	26
11 878.9	1.195	1,g								1	18	<25
11 879.4	1.156	2,u	2	2	0	1	1	1	1	4	18	57
11 879.9	1.208	2,g								0	18	<25
11 880.4	1.206	2,u	0	0	0	17	1	1	1	0	18	26
11 881.4	1.182	2,g								2	18	<25
11 881.4	1.168	1,u	1	1	1	1	−1	4	2	3	18	25
11 881.9	1.195	1,u								1	18	<25
11 881.9	1.184	0,u^+								2	18	<25
11 882.5	1.195	1,g								1	18	<25
11 885.2	1.185	0,g^+								2	18	<25
11 887.5	1.180	0,g^-	1	0	1	3	−1	5	1	2	18	36
11 887.6	1.183	2,g								2	18	<25
11 887.8	1.172	1,u								3	18	<25
11 888.2	1.160	2,u	1	2	1	0	0	2	2	4	18	36
11 889.4	1.181	2,u	1	0	1	2	2	6	0	2	18	25
11 889.5	1.196	1,u								1	18	<25
11 889.8	1.185	0,u^+								2	18	<25
11 890.0	1.210	0,u^+								0	18	<25
11 890.4	1.209	0,g^+								0	18	<25
11 890.8	1.183	0,u^-	0	1	1	4	−2	6	2	2	18	26
11 891.1	1.184	0,g^+								2	18	<25
11 892.0	1.180	0,u^+	2	0	0	3	1	5	−1	2	18	33
11 892.1	1.168	1,u								3	18	<25
11 893.2	1.181	2,g								2	18	<25
11 893.3	1.184	2,u								2	18	<25
11 893.9	1.196	1,u								1	18	<25
11 894.4	1.209	0,u^-								0	18	<25
11 895.5	1.185	2,g								2	18	<25
11 896.8	1.196	1,g								1	18	<25
11 898.2	1.209	0,g^-								0	18	<25
11 899.1	1.160	0,u^-	1	3	0	1	−1	3	1	4	18	77
11 900.0	1.184	2,u								2	18	<25
11 900.7	1.172	1,g	0	2	1	2	2	5	−1	3	18	32
		1,g	0	2	1	2	−2	5	3	3	18	33
11 900.7	1.182	0,g^+								2	18	<25
11 901.6	1.209	2,u								0	18	<25
11 902.7	1.210	2,g								0	18	<25
11 903.3	1.207	2,u								0	18	<25
11 903.5	1.162	0,u^+	1	3	0	1	1	3	−1	4	18	43
		0,u^+	0	4	0	1	1	5	−1	4	18	51
11 905.1	1.209	2,g								0	18	<25
11 905.2	1.184	2,u								2	18	<25
11 905.6	1.184	2,g								2	18	<25
11 906.8	1.164	1,g	2	0	1	0	0	3	1	3	18	49
11 907.2	1.196	1,u								1	18	<25
11 907.7	1.206	0,u^+	0	0	0	17	1	1	−1	0	18	30
11 908.0	1.180	2,u								2	18	<25
11 908.9	1.167	1,u	2	1	0	2	−2	3	3	3	18	33
11 909.1	1.196	1,g								1	18	<25
11 911.1	1.160	2,u	1	3	0	1	−1	3	3	4	18	57
11 912.3	1.182	0,u^-	1	1	0	5	−1	5	1	2	18	26
11 912.7	1.209	2,u								0	18	<25
11 913.2	1.183	2,g								2	18	<25
11 916.8	1.162	2,u	1	3	0	1	1	3	1	4	18	31
		2,u	0	4	0	1	−1	5	3	4	18	36
11 916.8	1.182	0,g^+								2	18	<25
11 918.2	1.161	1,g	0	4	0	7	1	0	0	4	19	89
11 919.9	1.182	2,u								2	18	<25
11 920.2	1.180	0,g^+								2	18	<25
11 921.4	1.195	1,g								1	18	<25
11 921.6	1.184	0,g^-	0	1	1	3	−3	7	3	2	18	26
11 923.6	1.179	0,u^-	2	0	0	3	−3	5	3	2	18	58
11 924.2	1.209	0,g^+								0	18	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 924.4	1.175	1,*g*	0	3	0	3	1	6	0	3	18	32
11 926.1	1.194	1,*u*								1	18	<25
11 927.4	1.167	1,*u*	2	1	0	2	0	3	1	3	18	48
11 927.6	1.182	0,u^+	1	0	1	2	2	6	−2	2	18	36
11 927.7	1.183	2,*g*								2	18	<25
11 929.0	1.195	1,*g*								1	18	<25
11 929.3	1.179	2,*g*	2	0	0	4	0	4	2	2	18	28
11 930.0	1.173	1,*g*	0	2	1	2	0	5	1	3	18	33
11 930.5	1.173	1,*u*								3	18	<25
11 931.8	1.208	0,u^-	0	0	0	7	−7	11	7	0	18	32
11 932.6	1.150	0,g^+	3	1	0	0	0	0	0	4	18	90
11 933.9	1.172	1,*u*	1	2	0	2	2	5	−1	3	18	27
		1,*u*	1	2	0	2	−2	5	3	3	18	27
11 933.9	1.195	1,*g*								1	18	<25
11 934.9	1.183	0,u^+								2	18	<25
11 935.1	1.179	2,*u*	2	0	0	3	−3	5	5	2	18	50
11 935.6	1.208	2,*g*								0	18	<25
11 936.5	1.195	1,*u*								1	18	<25
11 937.2	1.184	2,*g*								2	18	<25
11 938.0	1.197	1,*g*								1	18	<25
11 938.4	1.183	0,g^-	1	1	0	4	−2	6	2	2	18	30
11 938.7	1.196	1,*u*								1	18	<25
11 938.8	1.208	2,*u*								0	18	<25
11 939.2	1.164	0,u^-	0	4	0	1	−1	5	1	4	18	84
11 939.5	1.182	2,*u*								2	18	<25
11 939.7	1.181	0,g^+	1	0	1	1	1	7	−1	2	18	45
11 941.5	1.210	0,u^+								0	18	<25
11 941.8	1.207	2,*g*	0	0	0	18	2	0	0	0	18	26
11 942.9	1.205	0,g^+	0	0	0	18	0	0	0	0	18	49
11 943.0	1.184	0,u^+								2	18	<25
11 943.7	1.197	1,*u*								1	18	<25
11 945.7	1.196	1,*g*								1	18	<25
11 947.8	1.162	1,*g*	3	0	0	1	−1	2	2	3	18	49
11 948.2	1.210	2,*u*								0	18	<25
11 948.4	1.182	0,u^+								2	18	<25
11 949.1	1.168	0,g^+								3	19	<25
11 949.2	1.183	2,*g*								2	18	<25
11 949.4	1.184	0,u^-	1	1	0	3	−3	7	3	2	18	37
11 950.1	1.164	2,*u*	0	4	0	1	1	5	1	4	18	50
		2,*u*	0	4	0	1	−1	5	3	4	18	36
11 950.8	1.183	2,*u*								2	18	<25
11 950.9	1.167	0,u^+								3	19	<25
11 951.4	1.196	1,*u*								1	18	<25
11 951.6	1.179	1,*g*								2	19	<25
11 951.7	1.179	1,*u*								2	19	<25
11 952.5	1.207	0,g^-	0	0	0	16	−2	2	2	0	18	26
11 954.5	1.181	2,*g*								2	18	<25
11 955.0	1.169	2,*g*	0	3	0	10	2	0	0	3	19	25
11 956.7	1.162	1,*g*	3	0	0	1	1	2	0	3	18	54
		1,*g*	3	0	0	1	−1	2	2	3	18	33
11 957.1	1.167	2,*u*								3	19	<25
11 957.1	1.196	1,*u*								1	18	<25
11 957.6	1.196	1,*g*								1	18	<25
11 957.8	1.183	2,*u*								2	18	<25
11 958.4	1.171	1,*u*	0	1	2	0	0	5	1	3	18	54
11 958.8	1.182	2,*u*								2	18	<25
11 959.5	1.207	2,*g*								0	18	<25
11 963.4	1.184	2,*u*								2	18	<25
11 965.2	1.210	0,g^-								0	18	<25
11 965.2	1.151	0,g^+	0	5	0	4	0	0	0	5	19	98
11 966.8	1.210	0,u^-								0	18	<25
11 968.5	1.151	2,*g*	0	5	0	4	2	0	0	5	19	98
11 968.9	1.180	0,u^+	1	0	1	2	0	6	0	2	18	27
11 970.1	1.167	0,g^+	1	0	2	4	0	0	0	3	19	32

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,g^+$	0	3	0	10	0	0	0	3	19	29
11 971.1	1.175	$1,u$	0	3	0	2	2	7	−1	3	18	30
		$1,u$	0	3	0	2	−2	7	3	3	18	32
11 972.2	1.184	$0,g^+$	0	1	1	3	3	7	−3	2	18	34
11 973.4	1.196	$1,g$								1	18	<25
11 974.2	1.196	$1,u$								1	18	<25
11 974.6	1.211	$2,g$								0	18	<25
11 975.1	1.186	$0,g^-$								2	18	<25
11 975.2	1.167	$2,g$	1	0	2	4	2	0	0	3	19	37
		$2,g$	0	3	0	10	2	0	0	3	19	26
11 975.4	1.168	$0,u^+$	0	3	0	9	1	1	−1	3	19	26
11 975.9	1.162	$1,u$	0	4	0	6	2	1	−1	4	19	49
		$1,u$	0	4	0	6	0	1	1	4	19	31
11 976.4	1.180	$2,u$								2	18	<25
11 976.4	1.186	$0,u^-$	0	2	0	3	−1	9	1	2	18	26
11 978.1	1.209	$0,g^+$								0	18	<25
11 978.6	1.169	$1,g$	1	1	1	0	0	5	1	3	18	37
11 979.6	1.167	$2,u$	0	0	3	4	2	0	0	3	19	25
11 980.5	1.185	$2,g$								2	18	<25
11 980.5	1.161	$0,u^+$	0	3	1	0	0	4	0	4	18	93
11 982.0	1.210	$2,u$								0	18	<25
11 982.1	1.171	$1,u$	1	2	0	2	0	5	1	3	18	43
11 983.2	1.197	$1,u$								1	18	<25
11 983.8	1.207	$0,u^-$	0	0	0	17	−1	1	1	0	18	35
11 984.5	1.183	$0,u^-$	0	0	2	1	−1	7	1	2	18	41
11 986.1	1.186	$2,u$								2	18	<25
11 986.7	1.209	$2,g$								0	18	<25
11 987.0	1.207	$2,u$	0	0	0	17	1	1	1	0	18	26
11 987.2	1.210	$0,u^+$								0	18	<25
11 989.2	1.185	$2,g$								2	18	<25
11 990.3	1.195	$1,g$								1	18	<25
11 990.8	1.185	$0,u^+$	0	1	1	2	2	8	−2	2	18	30
11 994.6	1.156	$0,g^+$	2	2	0	0	0	2	0	4	18	72
11 994.7	1.161	$2,u$	0	3	1	0	0	4	2	4	18	92
11 996.7	1.211	$0,g^+$								0	18	<25
11 996.8	1.185	$0,u^-$	0	0	2	1	−1	7	1	2	18	26
		$0,u^-$	0	2	0	3	−3	9	3	2	18	37
11 997.3	1.195	$1,u$								1	18	<25
11 997.3	1.197	$1,g$								1	18	<25
11 997.9	1.184	$2,u$								2	18	<25
11 998.1	1.182	$0,g^+$								2	18	<25
12 000.1	1.172	$1,u$	0	2	1	1	1	6	0	3	18	35
		$1,u$	0	2	1	1	−1	6	2	3	18	29
12 001.3	1.180	$0,g^+$	2	0	0	2	2	6	−2	2	18	37
12 003.1	1.198	$1,g$								1	18	<25
12 003.5	1.210	$2,u$								0	18	<25
12 005.3	1.184	$2,u$								2	18	<25
12 005.5	1.185	$0,g^+$								2	18	<25
12 005.6	1.179	$0,u^-$	2	0	0	3	−1	5	1	2	18	52
12 005.6	1.170	$0,g^+$								3	19	<25
12 006.7	1.183	$2,g$								2	18	<25
12 007.0	1.194	$1,g$								1	18	<25
12 007.4	1.196	$1,u$								1	18	<25
12 008.7	1.170	$2,g$								3	19	<25
12 008.8	1.182	$0,g^-$	1	0	1	1	−1	7	1	2	18	47
12 009.2	1.156	$2,g$	2	2	0	0	0	2	2	4	18	77
12 010.2	1.208	$0,u^+$								0	18	<25
12 011.1	1.185	$2,u$								2	18	<25
12 012.0	1.210	$0,g^-$								0	18	<25
12 013.4	1.197	$1,u$								1	18	<25
12 013.5	1.183	$0,u^+$	1	1	0	3	3	7	−3	2	18	36
12 015.2	1.209	$2,u$								0	18	<25
12 015.5	1.180	$2,g$	2	0	0	2	−2	6	4	2	18	26
12 016.2	1.197	$1,u$								1	18	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 016.4	1.211	2,*g*								0	18	<25
12 016.5	1.179	2,*u*	2	0	0	3	1	5	1	2	18	31
12 019.4	1.168	1,*g*	2	1	0	1	−1	4	2	3	18	31
		1,*g*	1	1	1	0	0	5	1	3	18	44
12 019.8	1.194	$0,u^+$								1	19	<25
12 019.8	1.194	$0,g^+$								1	19	<25
12 020.3	1.185	2,*g*								2	18	<25
12 020.3	1.197	1,*g*								1	18	<25
12 022.4	1.181	2,*g*	1	0	1	1	−1	7	3	2	18	37
12 023.0	1.162	1,*u*	0	4	0	6	2	1	−1	4	19	37
		1,*u*	0	4	0	6	0	1	1	4	19	53
12 023.7	1.196	1,*g*								1	18	<25
12 024.6	1.210	2,*g*								0	18	<25
12 025.0	1.184	2,*u*								2	18	<25
12 026.5	1.209	1,*g*								0	17	<25
12 026.5	1.209	1,*u*								0	17	<25
12 026.8	1.179	1,*g*	0	0	2	9	1	0	0	2	19	29
12 028.4	1.194	2,*u*								1	19	<25
12 028.4	1.194	2,*g*								1	19	<25
12 028.8	1.179	1,*u*	1	0	1	9	1	0	0	2	19	31
12 028.9	1.173	1,*g*								3	18	<25
12 029.1	1.183	$0,g^-$	0	1	1	3	−1	7	1	2	18	26
12 030.5	1.175	1,*u*								3	18	<25
12 032.0	1.161	$0,g^+$	1	3	0	0	0	4	0	4	18	57
12 032.4	1.169	$0,u^+$	1	1	1	6	0	0	0	3	19	30
		$0,u^+$	0	3	0	9	1	1	−1	3	19	28
12 032.9	1.170	2,*u*	0	3	0	9	3	1	−1	3	19	38
12 033.1	1.172	$0,u^-$	0	3	0	9	−1	1	1	3	19	58
12 033.3	1.209	$0,u^-$	0	0	0	5	−5	13	5	0	18	33
12 033.6	1.168	1,*g*	2	1	0	1	1	4	0	3	18	43
		1,*g*	2	1	0	1	−1	4	2	3	18	34
12 035.2	1.175	1,*u*								3	18	<25
12 036.1	1.180	1,*u*								2	19	<25
12 036.4	1.180	1,*g*								2	19	<25
12 037.6	1.210	2,*u*								0	18	<25
12 039.8	1.181	1,*u*								2	19	<25
12 040.2	1.181	1,*g*								2	19	<25
12 040.3	1.183	2,*g*								2	18	<25
12 040.4	1.168	$0,g^+$	0	1	2	6	0	0	0	3	19	38
12 041.2	1.171	2,*u*	0	3	0	9	1	1	1	3	19	48
12 042.1	1.196	1,*u*								1	18	<25
12 042.1	1.170	$0,u^+$								3	19	<25
12 042.2	1.211	$0,u^+$								0	18	<25
12 042.6	1.169	2,*g*	0	1	2	6	2	0	0	3	19	34
12 044.9	1.207	$0,g^+$								0	18	<25
12 045.3	1.161	2,*g*	1	3	0	0	0	4	2	4	18	62
12 046.9	1.170	2,*u*								3	19	<25
12 046.9	1.185	$0,u^-$	0	1	1	2	−2	8	2	2	18	59
12 047.5	1.207	2,*g*								0	18	<25
12 047.8	1.197	1,*u*								1	18	<25
12 048.4	1.198	1,*g*								1	18	<25
12 048.4	1.171	$0,g^-$	0	3	0	8	−2	2	2	3	19	42
12 049.0	1.181	$0,g^-$	2	0	0	2	−2	6	2	2	18	40
		$0,g^-$	1	0	1	1	−1	7	1	2	18	35
12 052.1	1.162	1,*g*	0	4	0	5	3	2	−2	4	19	32
		1,*g*	0	4	0	5	1	2	0	4	19	25
12 054.5	1.184	$0,g^+$	0	0	2	0	0	8	0	2	18	35
12 055.3	1.171	2,*g*								3	19	<25
12 056.7	1.159	1,*u*	0	3	1	5	1	0	0	4	19	76
12 056.8	1.186	$0,u^+$	0	2	0	3	3	9	−3	2	18	27
12 058.2	1.181	2,*g*	2	0	0	2	−2	6	4	2	18	31
12 058.8	1.185	2,*u*	0	1	1	2	−2	8	4	2	18	35
12 060.8	1.210	2,*u*								0	18	<25
12 061.8	1.185	$0,g^+$	0	0	2	0	0	8	0	2	18	33

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 062.7	1.195	1,g								1	18	<25
12 063.7	1.198	1,u								1	18	<25
12 064.4	1.166	0,g^+	1	0	2	4	0	0	0	3	19	26
12 065.6	1.187	0,g^+	0	2	0	2	2	10	−2	2	18	25
12 067.2	1.163	1,u	3	0	0	0	0	3	1	3	18	88
12 067.5	1.209	0,g^-								0	18	<25
12 068.7	1.166	2,g	0	0	3	3	3	1	−1	3	19	29
12 069.6	1.210	2,g								0	18	<25
12 069.9	1.184	2,g								2	18	<25
12 069.9	1.186	2,u								2	18	<25
12 072.7	1.167	0,u^+	1	0	2	3	1	1	−1	3	19	34
12 073.0	1.182	0,u^+	1	0	1	0	0	8	0	2	18	43
12 073.4	1.198	1,u								1	18	<25
12 074.2	1.175	1,g	0	3	0	1	1	8	0	3	18	27
		1,g	0	3	0	1	−1	8	2	3	18	26
12 075.0	1.164	0,g^+	1	3	0	0	0	4	0	4	18	25
		0,g^+	0	4	0	0	0	6	0	4	18	73
12 075.2	1.167	0,u^-	1	0	2	3	−1	1	1	3	19	34
12 075.9	1.187	2,g								2	18	<25
12 076.5	1.210	0,g^+	0	0	0	4	4	14	−4	0	18	32
12 076.7	1.197	1,g								1	18	<25
12 076.9	1.185	2,g	0	0	2	0	0	8	2	2	18	35
12 077.0	1.167	2,u								3	19	<25
12 079.1	1.195	1,u								1	18	<25
12 079.7	1.166	0,g^-	2	0	1	3	−1	1	1	3	19	27
		0,g^-	0	0	3	3	−1	1	1	3	19	40
12 081.3	1.152	0,u^+	0	5	0	3	1	1	−1	5	19	95
12 081.4	1.167	2,u	1	0	2	3	3	1	−1	3	19	30
12 082.2	1.197	1,g								1	18	<25
12 082.3	1.152	2,u	0	5	0	3	3	1	−1	5	19	81
12 082.4	1.183	0,u^-	1	1	0	3	−1	7	1	2	18	40
12 084.3	1.210	2,g								0	18	<25
12 084.3	1.198	1,g								1	18	<25
12 084.8	1.180	1,g								2	19	<25
12 084.9	1.172	1,g	1	2	0	1	1	6	0	3	18	38
		1,g	1	2	0	1	−1	6	2	3	18	34
12 085.0	1.184	0,g^-	1	1	0	2	−2	8	2	2	18	63
12 086.6	1.166	2,g	0	0	3	3	1	1	1	3	19	25
12 086.8	1.182	2,u	1	0	1	0	0	8	2	2	18	44
12 087.6	1.164	2,g	0	4	0	0	0	6	2	4	18	75
12 088.3	1.195	0,u^-								1	19	<25
12 088.3	1.195	0,g^-								1	19	<25
12 088.5	1.179	0,g^+	2	0	0	2	2	6	−2	2	18	29
		0,g^+	2	0	0	2	0	6	0	2	18	40
12 089.1	1.162	1,g	0	4	0	5	3	2	−2	4	19	44
		1,g	0	4	0	5	−1	2	2	4	19	30
12 089.3	1.169	0,u^+	0	2	1	8	0	0	0	3	19	31
12 091.1	1.169	2,u	0	2	1	8	2	0	0	3	19	26
12 091.2	1.180	1,g								2	19	<25
12 092.0	1.183	2,u								2	18	<25
12 092.1	1.196	1,u								1	18	<25
12 092.7	1.179	1,u								2	19	<25
12 094.7	1.211	2,u								0	18	<25
12 094.8	1.210	0,u^-								0	18	<25
12 094.9	1.194	2,g								1	19	<25
12 094.9	1.194	2,u								1	19	<25
12 097.5	1.159	1,g	1	3	0	5	1	0	0	4	19	37
12 097.6	1.184	2,g	1	1	0	2	2	8	0	2	18	27
		2,g	1	1	0	2	−2	8	4	2	18	35
12 097.7	1.196	1,g								1	18	<25
12 097.9	1.181	1,u								2	19	<25
12 099.2	1.170	0,u^-	1	0	2	3	−1	1	1	3	19	26
		0,u^-	0	3	0	7	−3	3	3	3	19	34
12 100.3	1.179	2,g	2	0	0	2	0	6	2	2	18	40

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 103.1	1.211	$0,g^-$								0	18	<25
12 103.7	1.211	$0,g^+$								0	18	<25
12 104.9	1.170	$2,u$								3	19	<25
12 104.9	1.208	$0,u^-$								0	18	<25
12 105.0	1.182	$1,u$								2	19	<25
12 105.3	1.169	$0,g^+$	0	1	2	6	0	0	0	3	19	31
		$0,g^+$	1	2	0	8	0	0	0	3	19	31
12 105.8	1.186	$0,g^+$	0	1	1	1	1	9	−1	2	18	66
12 105.9	1.169	$2,g$								3	19	<25
12 106.0	1.181	$1,g$								2	19	<25
12 106.2	1.185	$0,u^+$								2	18	<25
12 106.4	1.181	$1,u$								2	19	<25
12 106.8	1.169	$0,g^+$								3	19	<25
12 107.8	1.211	$0,u^+$	0	0	0	3	3	15	−3	0	18	25
12 108.1	1.208	$2,u$								0	18	<25
12 108.2	1.169	$2,g$	1	2	0	8	2	0	0	3	19	42
12 108.3	1.181	$1,g$								2	19	<25
12 108.3	1.152	$0,u^-$	0	5	0	3	−1	1	1	5	19	99
12 108.4	1.194	$0,u^+$								1	19	<25
12 108.4	1.194	$0,g^+$								1	19	<25
12 109.2	1.211	$2,g$								0	18	<25
12 110.9	1.210	$1,u$								0	19	<25
12 110.9	1.210	$1,g$								0	19	<25
12 111.7	1.198	$1,g$								1	18	<25
12 113.9	1.171	$0,g^+$	0	2	1	7	1	1	−1	3	19	38
12 114.4	1.152	$2,u$	0	5	0	3	1	1	1	5	19	83
12 115.5	1.171	$2,g$	0	2	1	7	3	1	−1	3	19	26
12 116.2	1.194	$2,u$								1	19	<25
12 116.2	1.194	$2,g$								1	19	<25
12 117.5	1.168	$2,u$	1	1	1	6	2	0	0	3	19	29
12 117.7	1.168	$0,u^+$	1	1	1	6	0	0	0	3	19	33
12 118.3	1.197	$1,u$								1	18	<25
12 118.6	1.185	$2,u$								2	18	<25
12 119.5	1.170	$0,g^-$	0	2	1	7	−1	1	1	3	19	36
12 120.0	1.186	$2,g$	0	1	1	1	1	9	1	2	18	26
		$2,g$	0	1	1	1	−1	9	3	2	18	39
12 120.8	1.182	$0,u^+$	2	0	0	1	1	7	−1	2	18	39
		$0,u^+$	1	0	1	0	0	8	0	2	18	35
12 124.1	1.173	$0,g^+$	0	3	0	8	0	2	0	3	19	27
12 124.5	1.197	$1,u$								1	18	<25
12 124.6	1.210	$2,u$								0	18	<25
12 125.6	1.181	$1,g$								2	19	<25
12 126.3	1.170	$2,g$								3	19	<25
12 126.8	1.210	$2,g$								0	18	<25
12 127.2	1.210	$0,u^+$								0	18	<25
12 127.4	1.181	$1,u$								2	19	<25
12 129.9	1.174	$1,g$	0	2	1	0	0	7	1	3	18	81
12 130.1	1.157	$1,g$	0	2	2	3	1	0	0	4	19	35
		$1,g$	1	3	0	5	1	0	0	4	19	40
12 130.2	1.197	$1,u$								1	18	<25
12 131.7	1.172	$2,g$	0	3	0	8	0	2	2	3	19	36
12 134.1	1.188	$0,g^-$	0	2	0	2	−2	10	2	2	18	56
12 134.3	1.181	$2,u$	2	0	0	1	−1	7	3	2	18	27
		$2,u$	1	0	1	0	0	8	2	2	18	35
12 134.4	1.169	$1,u$	2	1	0	0	0	5	1	3	18	66
12 134.9	1.169	$0,u^-$	0	1	2	5	−1	1	1	3	19	34
12 135.2	1.181	$1,g$								2	19	<25
12 136.5	1.182	$1,u$								2	19	<25
12 136.8	1.176	$1,g$	0	3	0	1	1	8	0	3	18	31
		$1,g$	0	3	0	1	−1	8	2	3	18	42
12 137.6	1.158	$1,u$								4	19	<25
12 138.1	1.163	$1,g$	0	4	0	5	1	2	0	4	19	49
		$1,g$	0	4	0	5	−1	2	2	4	19	28
12 138.6	1.186	$0,u^+$	1	1	0	1	1	9	−1	2	18	44

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 138.7	1.210	2,u								0	18	<25
12 139.2	1.169	2,u	0	1	2	5	1	1	1	3	19	25
12 139.8	1.182	1,u								2	19	<25
12 140.2	1.171	2,g	0	3	0	6	6	4	−4	3	19	30
12 141.4	1.182	1,g								2	19	<25
12 142.8	1.210	0,u^-								0	18	<25
12 143.5	1.170	0,g^+								3	19	<25
12 143.9	1.172	0,g^-								3	19	<25
12 146.0	1.173	0,u^+	0	3	0	7	3	3	−3	3	19	29
12 146.5	1.188	2,g	0	2	0	2	−2	10	4	2	18	32
12 147.2	1.170	0,u^+	1	2	0	7	1	1	−1	3	19	42
12 147.4	1.197	1,g								1	18	<25
12 147.8	1.169	2,u	1	2	0	7	3	1	−1	3	19	41
12 148.5	1.188	0,u^-	0	2	0	1	−1	11	1	2	18	27
12 149.4	1.197	1,g								1	18	<25
12 151.1	1.181	1,u								2	19	<25
12 151.8	1.171	2,g								3	19	<25
12 152.1	1.186	2,u								2	18	<25
12 153.1	1.160	1,u	0	4	0	4	4	3	−3	4	19	25
12 153.2	1.141	1,g	0	6	0	1	1	0	0	6	19	100
12 154.1	1.173	2,u	0	3	0	7	−1	3	3	3	19	31
12 154.1	1.180	1,g								2	19	<25
12 154.1	1.196	0,u^+								1	19	<25
12 154.1	1.196	0,g^+								1	19	<25
12 154.4	1.198	1,u								1	18	<25
12 156.9	1.210	2,u	0	0	0	3	−3	15	5	0	18	26
12 157.6	1.197	1,g								1	18	<25
12 159.9	1.188	2,u								2	18	<25
12 160.3	1.181	1,u								2	19	<25
12 160.4	1.211	0,g^+	0	0	0	2	2	16	−2	0	18	31
12 160.7	1.196	2,g								1	19	<25
12 160.7	1.196	2,u								1	19	<25
12 161.4	1.184	0,g^+	1	1	0	2	2	8	−2	2	18	27
		0,g^+	1	1	0	2	0	8	0	2	18	30
12 161.6	1.182	1,g								2	19	<25
12 162.9	1.195	0,u^+								1	19	<25
12 162.9	1.195	0,g^+								1	19	<25
12 163.0	1.158	1,g	0	3	1	4	2	1	−1	4	19	46
12 164.0	1.167	0,u^+								3	19	<25
12 164.7	1.211	2,g								0	18	<25
12 165.0	1.199	1,u								1	18	<25
12 165.0	1.180	0,u^-	2	0	0	1	−1	7	1	2	18	75
12 165.8	1.194	0,u^-								1	19	<25
12 165.8	1.194	0,g^-								1	19	<25
12 166.1	1.182	1,u								2	19	<25
12 167.7	1.195	2,u								1	19	<25
12 167.9	1.195	2,g								1	19	<25
12 168.3	1.210	0,g^+								0	18	<25
12 168.6	1.181	1,g								2	19	<25
12 171.6	1.184	2,g	1	1	0	2	0	8	2	2	18	30
12 171.9	1.160	1,u	0	4	0	4	4	3	−3	4	19	32
12 172.8	1.195	2,u								1	19	<25
12 172.8	1.195	2,g								1	19	<25
12 172.9	1.166	0,g^+								3	19	<25
12 173.0	1.181	1,g								2	19	<25
12 174.0	1.210	1,g								0	19	<25
12 174.0	1.210	1,u								0	19	<25
12 174.4	1.160	1,g	0	3	1	4	0	1	1	4	19	56
12 174.5	1.170	2,u	0	2	1	6	4	2	−2	3	19	29
12 176.2	1.198	1,u								1	18	<25
12 176.4	1.170	2,g	0	3	0	6	6	4	−4	3	19	25
12 176.9	1.210	2,g								0	18	<25
12 177.3	1.181	1,u								2	19	<25
12 177.3	1.167	0,u^+								3	19	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 177.4	1.170	$0,g^+$								3	19	<25
12 177.6	1.197	$1,g$								1	18	<25
12 177.6	1.180	$2,u$	2	0	0	1	1	7	1	2	18	41
		$2,u$	2	0	0	1	−1	7	3	2	18	35
12 177.8	1.159	$1,u$	1	2	1	3	1	0	0	4	19	26
12 177.8	1.167	$0,u^-$	0	0	3	2	−2	2	2	3	19	32
12 178.5	1.186	$0,g^-$	0	1	1	1	−1	9	1	2	18	66
12 179.1	1.167	$2,u$								3	19	<25
12 181.4	1.182	$1,g$								2	19	<25
12 181.4	1.210	$0,g^-$								0	18	<25
12 181.5	1.155	$1,g$	1	1	2	1	1	0	0	4	19	48
		$1,g$	0	2	2	3	1	0	0	4	19	27
12 181.9	1.173	$1,u$	1	2	0	0	0	7	1	3	18	52
12 182.7	1.182	$1,u$								2	19	<25
12 184.2	1.194	$0,u^+$								1	19	<25
12 184.2	1.194	$0,g^+$								1	19	<25
12 184.3	1.170	$2,g$								3	19	<25
12 184.3	1.149	$0,u^+$	0	4	1	2	0	0	0	5	19	95
12 185.2	1.171	$0,g^+$								3	19	<25
12 186.0	1.169	$0,u^+$								3	19	<25
12 186.8	1.169	$0,u^-$	1	2	0	7	−1	1	1	3	19	52
12 187.0	1.182	$1,g$								2	19	<25
12 187.3	1.166	$2,u$	2	0	1	4	2	0	0	3	19	27
12 187.5	1.149	$2,u$	0	4	1	2	2	0	0	5	19	96
12 188.3	1.166	$2,g$	1	0	2	2	2	2	0	3	19	37
12 188.4	1.169	$0,g^+$								3	19	<25
12 189.0	1.194	$2,g$								1	19	<25
12 189.8	1.194	$2,u$								1	19	<25
12 190.2	1.198	$1,g$								1	18	<25
12 190.6	1.166	$0,g^-$	1	0	2	2	−2	2	2	3	19	58
12 190.9	1.169	$2,u$	1	2	0	7	1	1	1	3	19	33
12 191.5	1.186	$2,g$	0	1	1	1	1	9	1	2	18	30
		$2,g$	0	1	1	1	−1	9	3	2	18	33
12 192.1	1.188	$0,u^+$	1	1	0	1	1	9	−1	2	18	32
		$0,u^+$	0	2	0	1	1	11	−1	2	18	53
12 193.3	1.167	$0,u^+$								3	19	<25
12 193.6	1.182	$1,u$								2	19	<25
12 195.4	1.171	$2,g$								3	19	<25
12 196.0	1.182	$1,g$								2	19	<25
12 196.1	1.210	$2,g$	0	0	0	2	−2	16	4	0	18	26
12 196.5	1.182	$1,u$								2	19	<25
12 196.7	1.181	$1,g$								2	19	<25
12 198.4	1.199	$1,u$								1	18	<25
12 198.9	1.169	$2,u$								3	19	<25
12 198.9	1.170	$0,u^-$	0	2	1	6	−2	2	2	3	19	38
12 200.0	1.166	$0,u^+$	2	0	1	4	0	0	0	3	19	27
12 202.3	1.167	$2,u$								3	19	<25
12 203.0	1.183	$1,g$								2	19	<25
12 203.4	1.182	$1,u$								2	19	<25
12 203.6	1.170	$2,g$	1	2	0	6	4	2	−2	3	19	48
12 203.6	1.159	$1,u$	1	3	0	4	2	1	−1	4	19	40
12 205.3	1.169	$0,g^+$								3	19	<25
12 205.7	1.188	$2,u$	0	2	0	1	−1	11	3	2	18	29
12 206.4	1.170	$0,g^+$								3	19	<25
12 208.4	1.168	$2,u$								3	19	<25
12 209.0	1.181	$1,u$								2	19	<25
12 209.7	1.199	$1,g$								1	18	<25
12 210.1	1.196	$0,u^-$								1	19	<25
12 210.1	1.196	$0,g^-$								1	19	<25
12 210.3	1.169	$2,g$								3	19	<25
12 211.9	1.162	$1,u$	0	4	0	4	2	3	−1	4	19	34
12 211.9	1.169	$0,g^-$								3	19	<25
12 214.0	1.168	$2,g$								3	19	<25
12 214.1	1.196	$2,u$								1	19	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 214.2	1.196	2,g								1	19	<25
12 214.2	1.182	1,g								2	19	<25
12 215.0	1.152	0,g^+	0	5	0	2	2	2	−2	5	19	51
		0,g^+	0	5	0	2	0	2	0	5	19	32
12 215.3	1.197	1,u								1	18	<25
12 216.2	1.171	0,u^-								3	19	<25
12 216.3	1.170	0,u^+	0	2	1	6	0	2	0	3	19	26
12 217.1	1.181	1,u								2	19	<25
12 217.2	1.194	2,g								1	19	<25
12 217.9	1.181	1,g								2	19	<25
12 218.4	1.209	1,g								0	19	<25
12 218.4	1.209	1,u								0	19	<25
12 218.6	1.182	1,u								2	19	<25
12 218.7	1.181	1,g								2	19	<25
12 219.1	1.212	0,u^+	0	0	0	1	1	17	−1	0	18	34
12 219.5	1.174	0,u^-	0	3	0	7	−1	3	1	3	19	44
12 219.6	1.194	0,u^+	0	0	1	12	2	2	−2	1	19	27
12 220.5	1.181	1,u								2	19	<25
12 220.5	1.160	1,u	1	3	0	4	0	1	1	4	19	41
12 220.7	1.172	0,u^+								3	19	<25
12 220.9	1.197	1,u								1	18	<25
12 221.3	1.194	0,g^+								1	19	<25
12 221.6	1.211	2,u	0	0	0	3	3	15	−1	0	18	28
12 222.0	1.195	2,u	0	0	1	8	8	6	−6	1	19	30
12 222.0	1.194	0,g^-								1	19	<25
12 222.2	1.186	0,g^+	2	0	0	0	0	8	0	2	18	27
12 222.4	1.172	2,u	0	2	1	6	0	2	2	3	19	25
12 222.4	1.182	1,g								2	19	<25
12 223.7	1.170	2,u								3	19	<25
12 224.0	1.198	1,g								1	18	<25
12 224.1	1.194	2,u								1	19	<25
12 224.5	1.194	0,u^-								1	19	<25
12 225.1	1.181	1,u								2	19	<25
12 226.5	1.183	1,g								2	19	<25
12 227.0	1.210	0,u^-								0	18	<25
12 227.3	1.166	0,g^+	2	1	0	6	0	0	0	3	19	50
12 228.0	1.194	0,u^+								1	19	<25
12 228.6	1.194	0,g^+								1	19	<25
12 229.0	1.173	2,u								3	19	<25
12 229.1	1.184	0,g^+	2	0	0	0	0	8	0	2	18	46
12 229.2	1.194	2,g								1	19	<25
12 230.0	1.187	0,u^+	0	1	1	0	0	10	0	2	18	76
12 230.7	1.166	2,g	2	1	0	6	2	0	0	3	19	44
12 231.0	1.150	2,g	1	4	0	2	2	0	0	5	19	45
		2,g	0	5	0	2	2	2	0	5	19	37
12 231.1	1.159	1,u	0	2	2	2	2	1	−1	4	19	34
12 232.0	1.153	0,g^-	0	5	0	2	−2	2	2	5	19	96
12 232.2	1.194	2,u								1	19	<25
12 233.1	1.185	0,u^-	1	1	0	1	−1	9	1	2	18	70
12 233.3	1.194	2,g								1	19	<25
12 233.4	1.210	0,g^-								0	18	<25
12 233.7	1.177	1,u	1	2	0	0	0	7	1	3	18	26
		1,u	0	3	0	0	0	9	1	3	18	70
12 234.3	1.211	2,g								0	18	<25
12 234.7	1.197	1,u								1	18	<25
12 235.0	1.187	2,g								2	18	<25
12 235.0	1.170	0,g^-	1	2	0	6	−2	2	2	3	19	60
12 235.5	1.211	0,u^+								0	18	<25
12 235.6	1.210	2,u								0	18	<25
12 236.3	1.169	0,g^+								3	19	<25
12 236.9	1.171	2,u								3	19	<25
12 237.5	1.149	0,g^+	1	4	0	2	0	0	0	5	19	82
12 239.4	1.194	0,g^+								1	19	<25
12 239.7	1.183	1,u								2	19	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 239.7	1.170	2,*g*								3	19	<25
12 240.5	1.186	2,*u*	0	1	1	0	0	10	2	2	18	48
12 240.6	1.210	1,*u*								0	19	<25
12 240.6	1.210	1,*g*								0	19	<25
12 240.9	1.172	0,u^-	1	1	1	4	−2	2	2	3	19	32
		0,u^-	0	3	0	5	−5	5	5	3	19	29
12 241.1	1.181	1,*g*								2	19	<25
12 241.5	1.170	2,*g*								3	19	<25
12 241.8	1.183	2,*g*	2	0	0	0	0	8	2	2	18	58
12 242.8	1.194	2,*u*								1	19	<25
12 243.3	1.211	2,*u*	0	0	0	1	−1	17	3	0	18	25
12 243.6	1.194	0,u^+								1	19	<25
12 244.0	1.195	0,u^-								1	19	<25
12 244.4	1.196	0,g^-								1	19	<25
12 244.5	1.195	2,*g*								1	19	<25
12 245.9	1.181	1,*u*								2	19	<25
12 246.0	1.182	1,*g*								2	19	<25
12 246.1	1.150	2,*g*	1	4	0	2	2	0	0	5	19	52
12 246.4	1.171	2,*g*	0	2	1	5	5	3	−3	3	19	46
12 246.9	1.194	2,*u*								1	19	<25
12 247.7	1.174	0,g^-	0	3	0	6	−2	4	2	3	19	38
12 248.1	1.186	2,*u*	1	1	0	1	1	9	1	2	18	28
		2,*u*	0	1	1	0	0	10	2	2	18	29
12 248.6	1.173	0,u^+	0	3	0	5	5	5	−5	3	19	30
12 249.6	1.182	1,*g*								2	19	<25
12 249.7	1.182	1,*u*								2	19	<25
12 250.4	1.211	0,u^-								0	18	<25
12 251.2	1.211	0,g^+								0	18	<25
12 252.4	1.159	1,*u*	0	2	2	2	0	1	1	4	19	34
12 252.5	1.194	0,u^-								1	19	<25
12 252.9	1.159	1,*g*								4	19	<25
12 253.6	1.194	2,*g*								1	19	<25
12 253.8	1.197	1,*g*								1	18	<25
12 253.8	1.169	0,g^+								3	19	<25
12 255.5	1.194	2,*u*								1	19	<25
12 256.2	1.174	2,*g*	0	3	0	6	−2	4	4	3	19	26
12 256.3	1.195	2,*g*								1	19	<25
12 256.3	1.193	0,u^+								1	19	<25
12 257.1	1.194	0,g^+								1	19	<25
12 257.5	1.181	1,*u*								2	19	<25
12 258.0	1.200	1,*g*	0	0	1	0	0	13	1	1	18	25
12 258.2	1.172	2,*u*								3	19	<25
12 259.3	1.194	0,g^-								1	19	<25
12 259.4	1.180	1,*g*								2	19	<25
12 259.9	1.181	1,*u*								2	19	<25
12 259.9	1.153	0,g^+	0	5	0	2	2	2	−2	5	19	30
		0,g^+	0	5	0	2	0	2	0	5	19	65
12 260.1	1.164	1,*u*	0	4	0	4	2	3	−1	4	19	28
		1,*u*	0	4	0	4	0	3	1	4	19	43
12 261.1	1.165	2,*g*	2	0	1	3	3	1	−1	3	19	37
12 262.3	1.194	2,*u*								1	19	<25
12 262.6	1.167	0,g^+								3	19	<25
12 263.2	1.181	1,*g*								2	19	<25
12 263.3	1.194	0,g^+								1	19	<25
12 263.6	1.194	0,u^+								1	19	<25
12 264.6	1.194	2,*g*								1	19	<25
12 264.8	1.194	2,*u*								1	19	<25
12 265.0	1.182	1,*u*								2	19	<25
12 265.1	1.195	0,u^-								1	19	<25
12 265.7	1.194	2,*g*								1	19	<25
12 265.9	1.211	2,*g*								0	18	<25
12 266.4	1.211	2,*u*								0	18	<25
12 267.1	1.183	1,*g*								2	19	<25
12 267.4	1.209	1,*g*								0	19	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 267.4	1.209	1,u								0	19	<25
12 267.9	1.153	2,g	0	5	0	2	2	2	0	5	19	37
		2,g	0	5	0	2	0	2	2	5	19	61
12 269.8	1.170	0,u^+								3	19	<25
12 270.0	1.171	0,g^-	0	2	1	5	−3	3	3	3	19	44
12 271.2	1.183	1,u								2	19	<25
12 271.5	1.182	1,g								2	19	<25
12 271.5	1.169	0,g^+								3	19	<25
12 271.7	1.170	2,u	1	2	0	5	5	3	−3	3	19	50
12 272.0	1.195	2,u								1	19	<25
12 272.4	1.195	0,g^+								1	19	<25
12 273.7	1.195	0,g^-								1	19	<25
12 274.1	1.195	0,u^+								1	19	<25
12 274.4	1.183	1,g								2	19	<25
12 274.5	1.170	0,u^+								3	19	<25
12 275.1	1.181	1,u								2	19	<25
12 276.0	1.183	1,u								2	19	<25
12 276.1	1.195	2,g								1	19	<25
12 276.2	1.171	2,g								3	19	<25
12 277.8	1.159	1,g	1	2	1	2	2	1	−1	4	19	39
12 278.2	1.195	2,u								1	19	<25
12 278.2	1.170	0,g^+	1	2	0	6	0	2	0	3	19	31
12 279.0	1.170	2,u								3	19	<25
12 279.3	1.199	1,u								1	18	<25
12 279.5	1.159	1,u	0	2	2	2	2	1	−1	4	19	31
		1,u	0	3	1	3	3	2	−2	4	19	41
12 280.0	1.197	1,g								1	18	<25
12 280.4	1.171	0,u^+	1	2	0	5	1	3	−1	3	19	35
12 281.0	1.183	1,g								2	19	<25
12 281.0	1.182	1,u								2	19	<25
12 281.1	1.211	0,g^+								0	18	<25
12 281.2	1.169	2,u								3	19	<25
12 282.0	1.160	1,g	1	2	1	2	0	1	1	4	19	28
12 282.2	1.195	0,g^+								1	19	<25
12 282.8	1.195	0,u^+								1	19	<25
12 283.8	1.170	2,g								3	19	<25
12 284.1	1.186	0,g^+	1	1	0	0	0	10	0	2	18	58
12 285.0	1.170	0,u^-	0	1	2	3	−3	3	3	3	19	35
12 286.0	1.195	2,u								1	19	<25
12 286.1	1.196	2,g								1	19	<25
12 288.0	1.181	1,u								2	19	<25
12 288.0	1.170	2,g								3	19	<25
12 288.6	1.211	2,g								0	18	<25
12 289.3	1.173	0,u^-								3	19	<25
12 289.7	1.165	0,g^-	2	0	1	3	−1	1	1	3	19	49
12 289.9	1.182	1,g								2	19	<25
12 290.0	1.196	0,g^-								1	19	<25
12 290.4	1.159	1,u	0	3	1	3	1	2	0	4	19	29
12 291.2	1.194	2,g								1	19	<25
12 291.3	1.166	2,g	2	0	1	3	1	1	1	3	19	30
12 291.8	1.182	1,g								2	19	<25
12 291.9	1.171	0,g^+								3	19	<25
12 292.0	1.167	0,u^+	1	0	2	1	1	3	−1	3	19	50
12 292.1	1.211	0,g^-	0	0	0	2	−2	16	2	0	18	38
12 292.2	1.182	1,g								2	19	<25
12 293.1	1.195	0,u^+								1	19	<25
12 293.3	1.182	1,u								2	19	<25
12 293.3	1.195	0,g^+								1	19	<25
12 294.4	1.195	2,u								1	19	<25
12 295.5	1.167	0,u^+	2	1	0	5	1	1	−1	3	19	48
12 295.8	1.189	0,u^-	0	2	0	1	−1	11	1	2	18	68
12 297.1	1.194	2,g								1	19	<25
12 297.3	1.186	2,g	1	1	0	0	0	10	2	2	18	59
12 298.7	1.161	1,u	0	3	1	3	1	2	0	4	19	34

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		1,u	0	3	1	3	−1	2	2	4	19	46
12 298.7	1.159	1,g	0	1	3	0	0	1	1	4	19	28
12 298.7	1.172	2,u								3	19	<25
12 298.7	1.181	1,g								2	19	<25
12 298.7	1.167	0,g^+	0	0	3	1	1	3	−1	3	19	31
12 298.8	1.169	2,u	2	1	0	5	3	1	−1	3	19	27
12 298.8	1.199	1,u								1	18	<25
12 299.0	1.212	0,u^+	0	0	0	1	1	17	−1	0	18	35
12 299.7	1.195	0,u^-								1	19	<25
12 300.0	1.170	2,g								3	19	<25
12 300.6	1.194	2,u								1	19	<25
12 300.7	1.169	0,g^-								3	19	<25
12 301.0	1.171	0,u^-	1	2	0	5	−3	3	3	3	19	57
12 302.4	1.181	1,g								2	19	<25
12 302.6	1.159	1,g								4	19	<25
12 302.9	1.194	0,g^-								1	19	<25
12 303.2	1.184	1,u								2	19	<25
12 303.4	1.209	1,g								0	19	<25
12 303.4	1.209	1,u								0	19	<25
12 303.8	1.194	2,g								1	19	<25
12 304.2	1.199	1,g								1	18	<25
12 305.0	1.168	2,u								3	19	<25
12 305.1	1.211	2,g	0	0	0	2	−2	16	4	0	18	30
12 305.4	1.182	1,u								2	19	<25
12 305.7	1.195	0,u^-								1	19	<25
12 306.5	1.195	2,u								1	19	<25
12 307.7	1.194	2,g	1	0	0	8	8	6	−6	1	19	25
12 307.7	1.189	2,u	0	2	0	1	1	11	1	2	18	35
		2,u	0	2	0	1	−1	11	3	2	18	34
12 308.1	1.194	0,g^+								1	19	<25
12 308.5	1.171	2,u								3	19	<25
12 309.2	1.212	2,u								0	18	<25
12 310.1	1.170	0,u^+								3	19	<25
12 310.1	1.169	0,g^-								3	19	<25
12 310.4	1.181	1,u								2	19	<25
12 311.2	1.195	0,u^-								1	19	<25
12 311.7	1.194	0,u^+								1	19	<25
12 311.9	1.154	1,u	1	1	2	0	0	1	1	4	19	73
12 312.1	1.210	1,g								0	19	<25
12 312.1	1.210	1,u								0	19	<25
12 312.2	1.195	0,g^-								1	19	<25
12 313.0	1.167	2,g								3	19	<25
12 313.1	1.180	1,u								2	19	<25
12 313.3	1.194	2,g								1	19	<25
12 313.7	1.156	1,g	2	2	0	3	1	0	0	4	19	59
12 313.8	1.183	1,g								2	19	<25
12 314.2	1.195	2,u								1	19	<25
12 314.5	1.168	2,u								3	19	<25
12 315.2	1.195	0,g^+								1	19	<25
12 315.7	1.169	0,u^-	1	0	2	1	−1	3	1	3	19	49
12 315.9	1.183	1,u								2	19	<25
12 316.8	1.159	1,g	1	3	0	3	3	2	−2	4	19	46
12 317.1	1.182	1,g	0	1	1	6	6	5	−5	2	19	26
12 318.0	1.167	0,u^-	2	1	0	5	−1	1	1	3	19	58
12 318.1	1.170	2,g								3	19	<25
12 318.1	1.195	2,g								1	19	<25
12 318.3	1.170	0,g^-	0	2	1	5	−1	3	1	3	19	32
12 318.4	1.195	2,u								1	19	<25
12 318.7	1.174	0,g^+								3	19	<25
12 318.9	1.195	2,u								1	19	<25
12 319.1	1.196	0,u^+								1	19	<25
12 319.6	1.149	0,g^+	0	4	1	1	1	1	−1	5	19	70
12 320.0	1.174	0,g^+								3	19	<25
12 320.6	1.184	1,g								2	19	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 321.5	1.195	2,g								1	19	<25
12 321.6	1.196	0,g^+								1	19	<25
12 322.9	1.182	1,u								2	19	<25
12 324.4	1.172	2,g								3	19	<25
12 325.8	1.196	0,g^+								1	19	<25
12 326.0	1.161	1,g								4	19	<25
12 326.4	1.199	1,u	1	0	0	0	0	13	1	1	18	30
12 327.0	1.196	0,u^+								1	19	<25
12 327.4	1.183	1,g								2	19	<25
12 327.7	1.168	2,u								3	19	<25
12 328.3	1.183	1,u	1	1	0	6	6	5	−5	2	19	31
12 328.8	1.180	1,g								2	19	<25
12 329.6	1.168	2,u	1	0	2	1	−1	3	3	3	19	25
12 330.3	1.173	2,g								3	19	<25
12 330.3	1.171	0,u^+	1	2	0	5	3	3	−3	3	19	37
12 330.8	1.194	0,u^+								1	19	<25
12 331.6	1.199	1,u								1	18	<25
12 331.8	1.171	2,g								3	19	<25
12 332.8	1.195	2,g								1	19	<25
12 333.1	1.168	0,g^+	1	1	1	3	3	3	−3	3	19	30
12 333.4	1.194	0,u^-								1	19	<25
12 333.6	1.182	1,g								2	19	<25
12 333.7	1.184	1,u								2	19	<25
12 333.8	1.196	2,u								1	19	<25
12 334.2	1.199	1,g								1	18	<25
12 334.8	1.209	1,g								0	19	<25
12 334.9	1.209	1,u								0	19	<25
12 335.5	1.194	2,u								1	19	<25
12 336.1	1.164	0,g^+	3	0	0	4	0	0	0	3	19	59
12 336.3	1.165	2,g	3	0	0	4	2	0	0	3	19	52
12 336.4	1.196	0,g^-								1	19	<25
12 336.9	1.209	1,u								0	19	<25
12 336.9	1.209	1,g								0	19	<25
12 337.0	1.195	2,g								1	19	<25
12 337.1	1.194	0,g^+								1	19	<25
12 337.7	1.150	0,g^-	0	4	1	1	−1	1	1	5	19	96
12 338.1	1.182	1,u								2	19	<25
12 338.3	1.171	2,u	1	2	0	5	−1	3	3	3	19	31
12 338.8	1.170	0,u^-	0	1	2	3	−1	3	1	3	19	26
12 339.6	1.182	1,g								2	19	<25
12 339.7	1.171	0,u^+								3	19	<25
12 339.8	1.195	2,g								1	19	<25
12 339.8	1.195	0,g^-								1	19	<25
12 340.1	1.163	1,g	1	3	0	3	−1	2	2	4	19	25
12 340.5	1.169	2,g								3	19	<25
12 341.0	1.190	0,g^+	0	2	0	0	0	12	0	2	18	67
12 341.1	1.195	0,u^+								1	19	<25
12 341.9	1.194	2,u								1	19	<25
12 342.4	1.211	0,u^-	0	0	0	1	−1	17	1	0	18	39
12 343.4	1.196	2,u								1	19	<25
12 343.6	1.142	1,u	0	6	0	0	0	1	1	6	19	100
12 344.6	1.183	1,u								2	19	<25
12 344.6	1.182	1,g								2	19	<25
12 346.0	1.150	2,g	0	4	1	1	1	1	1	5	19	95
12 346.7	1.161	1,g	1	3	0	3	1	2	0	4	19	40
12 347.3	1.195	2,g								1	19	<25
12 347.5	1.170	2,u								3	19	<25
12 347.8	1.199	1,g								1	18	<25
12 348.1	1.197	0,u^-								1	19	<25
12 349.1	1.174	0,g^-	0	3	0	4	−4	6	4	3	19	33
12 349.4	1.195	2,u								1	19	<25
12 349.4	1.172	0,u^-	0	2	1	4	−4	4	4	3	19	45
12 350.4	1.183	1,g								2	19	<25
12 350.4	1.153	1,u	2	1	1	1	1	0	0	4	19	58

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		1,u	0	1	3	1	1	0	0	4	19	28
12 350.4	1.166	0,u^+								3	19	<25
12 350.6	1.193	0,g^+								1	19	<25
12 350.7	1.181	1,u								2	19	<25
12 350.8	1.197	0,g^-								1	19	<25
12 351.6	1.196	2,g								1	19	<25
12 351.6	1.194	0,u^+								1	19	<25
12 351.7	1.175	0,u^+	0	3	0	5	3	5	−3	3	19	39
12 352.4	1.211	2,u								0	18	<25
12 352.8	1.172	2,u	0	2	1	4	4	4	−2	3	19	31
12 353.0	1.184	1,u								2	19	<25
12 353.8	1.195	0,g^-								1	19	<25
12 354.1	1.190	2,g	0	2	0	0	0	12	2	2	18	68
12 354.7	1.184	1,g								2	19	<25
12 355.1	1.195	0,u^-								1	19	<25
12 355.7	1.196	2,u								1	19	<25
12 356.5	1.196	2,g								1	19	<25
12 356.8	1.210	1,u	0	0	0	10	10	9	−9	0	19	45
12 357.0	1.184	1,u								2	19	<25
12 357.3	1.147	0,g^+	0	3	2	0	0	0	0	5	19	68
12 358.9	1.169	2,g	2	1	0	4	4	2	−2	3	19	52
12 359.2	1.209	1,g								0	19	<25
12 359.8	1.195	0,u^-								1	19	<25
12 361.1	1.174	2,u								3	19	<25
12 361.1	1.196	0,g^+								1	19	<25
12 361.2	1.169	0,g^+	2	1	0	4	2	2	−2	3	19	27
12 361.3	1.160	1,g								4	19	<25
12 362.0	1.183	1,g								2	19	<25
12 362.6	1.199	1,u	0	1	0	0	0	15	1	1	18	31
12 362.9	1.213	0,g^+	0	0	0	0	0	18	0	0	18	55
12 363.5	1.149	0,u^+	1	3	1	0	0	0	0	5	19	27
		0,u^+	1	4	0	1	1	1	−1	5	19	52
12 363.9	1.184	1,g								2	19	<25
12 364.2	1.194	2,g								1	19	<25
12 365.5	1.194	2,u								1	19	<25
12 365.8	1.165	2,u	2	0	1	2	2	2	0	3	19	27
12 366.0	1.182	1,u								2	19	<25
12 366.1	1.172	2,g								3	19	<25
12 366.6	1.165	0,u^-	2	0	1	2	−2	2	2	3	19	50
12 366.7	1.182	1,g								2	19	<25
12 367.6	1.172	0,u^+	0	2	1	4	4	4	−4	3	19	32
12 368.4	1.183	1,u								2	19	<25
12 368.8	1.195	0,u^+								1	19	<25
12 369.9	1.195	0,g^+								1	19	<25
12 370.6	1.172	0,g^+	1	2	0	4	4	4	−4	3	19	26
12 370.7	1.209	1,u								0	19	<25
12 371.2	1.195	2,u								1	19	<25
12 371.9	1.182	1,u								2	19	<25
12 372.4	1.197	0,g^+								1	19	<25
12 372.9	1.170	0,g^-	1	1	1	3	−1	3	1	3	19	31
12 373.6	1.213	2,g	0	0	0	0	0	18	2	0	18	54
12 374.1	1.184	1,g								2	19	<25
12 374.7	1.181	1,u								2	19	<25
12 374.7	1.195	0,u^+								1	19	<25
12 376.1	1.194	0,u^-								1	19	<25
12 376.2	1.171	0,u^-	1	2	0	5	−1	3	1	3	19	48
12 376.3	1.196	2,g								1	19	<25
12 377.4	1.196	0,g^+								1	19	<25
12 377.9	1.172	2,u								3	19	<25
12 377.9	1.183	1,u								2	19	<25
12 378.4	1.195	2,u								1	19	<25
12 378.4	1.170	2,g								3	19	<25
12 378.9	1.210	1,g								0	19	<25
12 379.3	1.195	2,g								1	19	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 379.4	1.160	1,g								4	19	<25
12 379.4	1.211	1,u								0	19	<25
12 380.7	1.209	1,g								0	19	<25
12 381.1	1.196	0,g^-								1	19	<25
12 381.4	1.179	1,g								2	19	<25
12 381.4	1.170	0,g^-	1	2	0	4	−4	4	4	3	19	32
12 381.9	1.196	0,u^+								1	19	<25
12 383.3	1.171	2,u	1	2	0	5	1	3	1	3	19	31
12 383.8	1.159	1,u								4	19	<25
12 384.0	1.196	0,u^-								1	19	<25
12 384.3	1.170	2,g								3	19	<25
12 384.6	1.149	0,u^+	1	3	1	0	0	0	0	5	19	51
		0,u^+	0	5	0	1	1	3	−1	5	19	46
12 384.8	1.181	1,g								2	19	<25
12 385.0	1.183	1,u								2	19	<25
12 385.5	1.196	2,u								1	19	<25
12 385.6	1.195	0,g^-								1	19	<25
12 386.1	1.170	0,u^+								3	19	<25
12 386.5	1.173	0,g^+	0	3	0	4	4	6	−4	3	19	28
12 386.8	1.164	1,g	0	4	0	3	1	4	0	4	19	38
		1,g	0	4	0	3	−1	4	2	4	19	30
12 386.9	1.170	0,g^-	2	1	0	4	−2	2	2	3	19	42
12 387.0	1.196	2,g								1	19	<25
12 387.8	1.195	2,g								1	19	<25
12 388.1	1.149	0,u^-	1	4	0	1	−1	1	1	5	19	87
12 388.3	1.195	2,u								1	19	<25
12 388.4	1.198	1,g								1	18	<25
12 389.3	1.171	2,g								3	19	<25
12 389.3	1.210	0,u^-								0	18	<25
12 389.4	1.211	0,g^+								0	18	<25
12 389.7	1.171	0,g^+								3	19	<25
12 390.0	1.151	2,u	1	4	0	1	1	1	1	5	19	55
		2,u	0	5	0	1	1	3	1	5	19	27
12 390.9	1.209	1,u								0	19	<25
12 390.9	1.165	0,u^+	2	0	1	2	0	2	0	3	19	30
12 392.8	1.172	0,u^-	0	2	1	4	−2	4	2	3	19	42
12 393.2	1.182	1,g								2	19	<25
12 393.5	1.211	2,u								0	18	<25
12 393.7	1.211	2,g								0	18	<25
12 393.9	1.196	0,u^-								1	19	<25
12 394.2	1.196	2,u								1	19	<25
12 395.8	1.166	2,u	2	0	1	2	0	2	2	3	19	31
12 396.1	1.196	2,g								1	19	<25
12 396.4	1.196	0,g^+								1	19	<25
12 397.7	1.196	0,u^+	1	0	0	7	7	7	−7	1	19	38
12 398.1	1.183	1,u								2	19	<25
12 398.5	1.150	0,u^+	1	4	0	1	1	1	−1	5	19	46
		0,u^+	0	5	0	1	1	3	−1	5	19	32
12 399.2	1.209	1,g								0	19	<25
12 399.6	1.173	2,g								3	19	<25
12 399.7	1.182	1,g								2	19	<25
12 400.7	1.171	2,u								3	19	<25
12 401.5	1.196	2,g								1	19	<25
12 401.5	1.210	1,u								0	19	<25
12 401.7	1.196	2,u								1	19	<25
12 402.1	1.200	1,u	0	1	0	0	0	15	1	1	18	32
12 402.7	1.184	1,u								2	19	<25
12 402.8	1.197	0,g^-								1	19	<25
12 402.9	1.183	1,g								2	19	<25
12 403.1	1.195	0,u^+								1	19	<25
12 404.7	1.196	2,u								1	19	<25
12 405.3	1.182	1,u								2	19	<25
12 405.4	1.209	1,g								0	19	<25
12 405.5	1.171	2,u								3	19	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 405.8	1.197	$0,u^-$								1	19	<25
12 406.4	1.173	$0,g^+$	1	2	0	4	4	4	−4	3	19	31
12 406.5	1.196	$0,g^-$								1	19	<25
12 406.8	1.183	$1,g$								2	19	<25
12 406.8	1.183	$1,u$								2	19	<25
12 407.2	1.195	$0,g^+$								1	19	<25
12 407.8	1.170	$2,g$								3	19	<25
12 407.9	1.152	$2,u$	1	4	0	1	1	1	1	5	19	37
		$2,u$	0	5	0	1	−1	3	3	5	19	50
12 409.0	1.196	$2,g$								1	19	<25
12 409.5	1.160	$1,g$	0	2	2	1	1	2	0	4	19	29
12 410.3	1.184	$1,g$								2	19	<25
12 410.4	1.171	$0,g^-$	1	1	1	3	−1	3	1	3	19	26
		$0,g^-$	0	1	2	2	−2	4	2	3	19	33
12 410.5	1.184	$1,u$								2	19	<25
12 411.4	1.158	$1,u$	1	2	1	1	−1	2	2	4	19	30
12 412.1	1.195	$2,u$								1	19	<25
12 414.7	1.164	$2,u$	3	0	0	3	3	1	−1	3	19	56
12 414.9	1.209	$1,u$								0	19	<25
12 414.9	1.211	$0,g^-$								0	18	<25
12 415.0	1.183	$1,u$								2	19	<25
12 415.1	1.211	$0,u^+$								0	18	<25
12 415.4	1.173	$2,g$								3	19	<25
12 415.9	1.167	$0,u^+$	3	0	0	3	1	1	−1	3	19	28
		$0,u^+$	0	0	3	0	0	4	0	3	19	29
12 416.1	1.195	$0,g^+$								1	19	<25
12 416.1	1.167	$0,g^+$	2	1	0	4	0	2	0	3	19	45
12 416.6	1.185	$1,g$								2	19	<25
12 416.9	1.196	$2,g$								1	19	<25
12 417.2	1.196	$0,u^+$								1	19	<25
12 417.5	1.196	$2,u$								1	19	<25
12 417.7	1.162	$1,u$								4	19	<25
12 417.7	1.153	$0,u^-$	0	5	0	1	−1	3	1	5	19	87
12 417.9	1.170	$2,g$								3	19	<25
12 418.9	1.170	$0,u^+$								3	19	<25
12 419.0	1.160	$1,g$	0	3	1	2	2	3	−1	4	19	28
12 419.6	1.196	$2,g$								1	19	<25
12 421.5	1.209	$1,g$								0	19	<25
12 422.1	1.197	$0,g^+$								1	19	<25
12 422.2	1.197	$0,u^+$								1	19	<25
12 422.3	1.168	$0,g^+$	1	0	2	0	0	4	0	3	19	55
12 422.7	1.182	$1,u$								2	19	<25
12 422.8	1.176	$0,u^-$	0	3	0	5	−1	5	1	3	19	40
12 423.2	1.196	$2,g$								1	19	<25
12 423.8	1.167	$0,u^+$	0	0	3	0	0	4	0	3	19	28
12 424.2	1.197	$2,u$								1	19	<25
12 424.2	1.209	$1,u$								0	19	<25
12 425.9	1.196	$2,g$								1	19	<25
12 426.0	1.174	$2,u$								3	19	<25
12 426.1	1.162	$1,g$	0	3	1	2	0	3	1	4	19	48
		$1,g$	0	3	1	2	−2	3	3	4	19	28
12 426.2	1.211	$2,g$								0	18	<25
12 426.3	1.211	$2,u$								0	18	<25
12 427.0	1.183	$1,g$								2	19	<25
12 427.1	1.170	$0,u^-$	1	1	1	2	−2	4	2	3	19	45
12 427.4	1.196	$2,u$								1	19	<25
12 427.4	1.153	$2,u$	0	5	0	1	1	3	1	5	19	60
		$2,u$	0	5	0	1	−1	3	3	5	19	33
12 427.7	1.195	$0,u^-$								1	19	<25
12 427.7	1.195	$0,g^-$								1	19	<25
12 428.7	1.172	$0,g^-$	1	2	0	4	−2	4	2	3	19	48
12 429.2	1.157	$1,u$	2	2	0	2	2	1	−1	4	19	41
		$1,u$	1	2	1	1	1	2	0	4	19	37
12 429.6	1.169	$2,g$								3	19	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 430.7	1.182	1,g								2	19	<25
12 432.3	1.196	0,u^-								1	19	<25
12 432.9	1.210	1,g	0	0	0	9	−9	10	10	0	19	59
12 433.7	1.172	2,u								3	19	<25
12 433.8	1.163	0,u^-	3	0	0	3	−1	1	1	3	19	77
12 434.5	1.182	1,g								2	19	<25
12 435.3	1.184	1,u								2	19	<25
12 436.1	1.170	2,u	0	0	3	0	0	4	2	3	19	31
12 436.1	1.196	0,u^+								1	19	<25
12 436.2	1.174	0,u^+	0	3	0	3	1	7	−1	3	19	29
12 436.5	1.169	2,g	1	0	2	0	0	4	2	3	19	36
12 438.5	1.196	2,u								1	19	<25
12 438.6	1.156	1,u	2	2	0	2	0	1	1	4	19	63
12 439.1	1.171	2,g								3	19	<25
12 439.4	1.184	1,u								2	19	<25
12 439.7	1.196	2,g								1	19	<25
12 439.9	1.171	0,g^+								3	19	<25
12 440.8	1.197	0,g^+								1	19	<25
12 441.5	1.184	1,g								2	19	<25
12 441.9	1.169	2,u	1	1	1	2	−2	4	4	3	19	33
12 442.0	1.196	2,u								1	19	<25
12 442.3	1.182	1,u								2	19	<25
12 443.0	1.211	1,g								0	19	<25
12 443.7	1.185	1,g								2	19	<25
12 443.7	1.210	1,u								0	19	<25
12 443.7	1.196	0,g^-								1	19	<25
12 444.4	1.172	0,g^+	0	2	1	3	1	5	−1	3	19	31
12 444.6	1.164	2,u	3	0	0	3	1	1	1	3	19	54
12 446.2	1.185	1,u								2	19	<25
12 446.9	1.194	2,g								1	19	<25
12 447.6	1.183	1,g								2	19	<25
12 448.0	1.161	1,u	1	3	0	2	2	3	−1	4	19	28
12 448.5	1.194	0,g^+	0	1	0	16	0	0	0	1	19	30
12 450.8	1.195	2,u								1	19	<25
12 450.9	1.171	2,g								3	19	<25
12 451.1	1.195	0,u^+								1	19	<25
12 451.5	1.161	1,u	1	3	0	2	−2	3	3	4	19	31
12 452.0	1.174	2,u								3	19	<25
12 452.3	1.195	0,u^-								1	19	<25
12 454.2	1.183	1,g								2	19	<25
12 454.2	1.196	0,g^-								1	19	<25
12 454.5	1.185	1,u								2	19	<25
12 454.8	1.169	0,u^+	2	1	0	3	3	3	−3	3	19	40
12 455.2	1.196	2,u								1	19	<25
12 456.0	1.196	2,g								1	19	<25
12 456.4	1.176	0,g^-	0	3	0	4	−2	6	2	3	19	44
12 457.3	1.183	1,u								2	19	<25
12 457.7	1.197	0,g^+								1	19	<25
12 458.2	1.196	2,g								1	19	<25
12 458.8	1.182	1,g								2	19	<25
12 458.9	1.210	1,u								0	19	<25
12 459.0	1.209	1,g								0	19	<25
12 459.3	1.181	1,u								2	19	<25
12 459.6	1.173	2,g								3	19	<25
12 459.6	1.210	1,g								0	19	<25
12 459.8	1.196	0,u^-								1	19	<25
12 459.9	1.198	0,u^+								1	19	<25
12 460.5	1.196	2,u								1	19	<25
12 460.6	1.211	0,u^-	0	0	0	1	−1	17	1	0	18	31
12 460.9	1.197	2,g								1	19	<25
12 461.9	1.211	0,g^+								0	18	<25
12 462.2	1.166	0,g^+	2	0	1	1	1	3	−1	3	19	39
12 462.7	1.184	1,g								2	19	<25
12 465.3	1.196	2,u								1	19	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 465.7	1.173	$0,g^-$	0	2	1	3	−3	5	3	3	19	47
12 466.5	1.168	$0,u^-$	2	1	0	3	−3	3	3	3	19	66
12 466.6	1.175	$2,g$	0	3	0	4	−2	6	4	3	19	26
12 467.2	1.182	$1,u$								2	19	<25
12 468.6	1.196	$2,g$								1	19	<25
12 469.0	1.197	$0,u^+$								1	19	<25
12 469.7	1.196	$0,u^-$								1	19	<25
12 470.3	1.209	$1,u$								0	19	<25
12 470.3	1.211	$2,u$								0	18	<25
12 470.3	1.196	$0,g^-$	1	0	0	6	−6	8	6	1	19	28
12 471.6	1.163	$1,u$	1	3	0	2	−2	3	3	4	19	31
		$1,u$	0	4	0	2	2	5	−1	4	19	30
12 471.8	1.212	$2,g$								0	18	<25
12 472.6	1.169	$2,u$	2	1	0	3	3	3	−1	3	19	36
12 472.9	1.169	$0,u^+$	1	1	1	2	2	4	−2	3	19	27
12 473.6	1.198	$0,g^+$								1	19	<25
12 475.1	1.162	$1,u$	1	3	0	2	2	3	−1	4	19	28
		$1,u$	1	3	0	2	0	3	1	4	19	38
12 475.5	1.153	$1,g$	2	1	1	0	0	1	1	4	19	46
12 476.3	1.184	$1,g$								2	19	<25
12 476.7	1.172	$0,g^+$	1	2	0	4	2	4	−2	3	19	29
		$0,g^+$	1	2	0	4	0	4	0	3	19	31
12 476.8	1.197	$2,u$								1	19	<25
12 477.2	1.167	$2,g$								3	19	<25
12 477.5	1.197	$2,u$								1	19	<25
12 479.5	1.196	$2,g$								1	19	<25
12 480.5	1.174	$0,u^-$	0	3	0	3	−3	7	3	3	19	28
12 480.9	1.184	$1,u$								2	19	<25
12 481.4	1.209	$1,g$								0	19	<25
12 481.5	1.171	$2,g$	0	2	1	3	−3	5	5	3	19	26
12 481.9	1.201	$1,g$								1	18	<25
12 482.4	1.172	$0,u^+$	1	2	0	3	3	5	−3	3	19	28
		$0,u^+$	1	2	0	3	1	5	−1	3	19	30
12 482.8	1.201	$1,u$								1	18	<25
12 482.8	1.182	$1,g$								2	19	<25
12 483.6	1.170	$2,u$								3	19	<25
12 485.6	1.172	$2,g$	1	2	0	4	0	4	2	3	19	30
12 485.8	1.183	$1,g$								2	19	<25
12 485.8	1.197	$2,g$								1	19	<25
12 486.0	1.197	$2,u$								1	19	<25
12 486.4	1.197	$0,g^+$								1	19	<25
12 486.9	1.197	$0,g^-$								1	19	<25
12 488.0	1.165	$0,g^-$	2	0	1	1	−1	3	1	3	19	45
12 488.7	1.185	$1,g$								2	19	<25
12 489.1	1.197	$0,u^+$								1	19	<25
12 490.5	1.170	$0,u^+$								3	19	<25
12 492.0	1.209	$1,u$								0	19	<25
12 492.3	1.173	$2,u$								3	19	<25
12 492.4	1.182	$1,u$	2	0	0	4	−4	5	5	2	19	25
12 492.6	1.196	$0,u^+$								1	19	<25
12 492.7	1.198	$0,u^-$								1	19	<25
12 493.1	1.196	$0,g^+$								1	19	<25
12 493.1	1.173	$0,g^+$	0	2	1	3	3	5	−3	3	19	37
12 493.5	1.198	$0,g^-$								1	19	<25
12 493.7	1.182	$1,u$								2	19	<25
12 494.0	1.197	$2,g$								1	19	<25
12 494.9	1.196	$2,u$								1	19	<25
12 495.4	1.151	$0,u^+$	0	4	1	0	0	2	0	5	19	96
12 495.8	1.184	$1,g$								2	19	<25
12 499.0	1.197	$2,u$								1	19	<25
12 499.3	1.173	$2,u$								3	19	<25
12 499.6	1.152	$1,g$	3	1	0	1	1	0	0	4	19	69
12 500.4	1.197	$2,g$								1	19	<25
12 500.8	1.167	$2,g$	2	0	1	1	−1	3	3	3	19	30

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 501.2	1.184	1,*g*								2	19	<25
12 501.9	1.184	1,*u*								2	19	<25
12 502.0	1.170	2,*u*	2	1	0	3	−1	3	3	3	19	27
12 502.1	1.209	1,*u*								0	19	<25
12 502.3	1.197	2,*g*								1	19	<25
12 503.7	1.210	1,*g*								0	19	<25
12 504.9	1.183	1,*u*								2	19	<25
12 505.7	1.195	$0,u^-$								1	19	<25
12 505.9	1.172	2,*g*								3	19	<25
12 507.1	1.161	1,*u*	0	2	2	0	0	3	1	4	19	40
12 507.7	1.183	1,*g*								2	19	<25
12 508.1	1.209	1,*g*								0	19	<25
12 508.8	1.197	2,*u*								1	19	<25
12 509.3	1.151	2,*u*	0	4	1	0	0	2	2	5	19	96
12 509.5	1.171	$0,u^+$	1	1	1	2	0	4	0	3	19	28
		$0,u^+$	0	1	2	1	1	5	−1	3	19	31
12 509.9	1.197	2,*g*								1	19	<25
12 510.2	1.166	$0,g^+$	3	0	0	2	2	2	−2	3	19	46
12 510.4	1.196	2,*u*								1	19	<25
12 511.2	1.184	1,*u*								2	19	<25
12 511.5	1.196	$0,g^+$								1	19	<25
12 512.0	1.174	$0,u^-$	1	2	0	3	−3	5	3	3	19	46
		$0,u^-$	0	3	0	3	−3	7	3	3	19	28
12 512.8	1.211	1,*u*								0	19	<25
12 513.9	1.196	$0,u^+$								1	19	<25
12 514.0	1.185	1,*g*								2	19	<25
12 514.4	1.186	1,*u*								2	19	<25
12 515.5	1.169	$0,g^+$								3	19	<25
12 515.8	1.165	1,*u*	0	4	0	2	0	5	1	4	19	42
12 516.3	1.196	2,*g*								1	19	<25
12 516.7	1.185	1,*u*								2	19	<25
12 517.5	1.197	$0,g^+$								1	19	<25
12 518.0	1.168	$0,u^-$	2	1	0	3	−1	3	1	3	19	68
12 518.5	1.145	$0,g^+$	2	3	0	0	0	0	0	5	19	79
12 518.6	1.164	$0,g^-$	3	0	0	2	−2	2	2	3	19	67
12 518.7	1.197	2,*u*								1	19	<25
12 518.8	1.196	$0,g^-$								1	19	<25
12 521.1	1.172	2,*u*								3	19	<25
12 521.4	1.185	1,*g*								2	19	<25
12 522.0	1.198	$0,u^+$								1	19	<25
12 523.0	1.210	1,*u*								0	19	<25
12 523.4	1.197	$0,u^-$								1	19	<25
12 523.7	1.196	$0,g^+$								1	19	<25
12 523.7	1.174	$0,g^-$	0	2	1	3	−1	5	1	3	19	53
12 523.8	1.196	2,*g*								1	19	<25
12 525.4	1.174	2,*u*								3	19	<25
12 526.9	1.173	$0,u^+$	1	2	0	3	3	5	−3	3	19	36
12 527.3	1.177	$0,g^+$	0	3	0	4	2	6	−2	3	19	30
		$0,g^+$	0	3	0	4	0	6	0	3	19	28
12 527.7	1.170	2,*g*								3	19	<25
12 528.3	1.197	2,*g*								1	19	<25
12 528.8	1.211	1,*g*								0	19	<25
12 530.1	1.159	1,*g*	1	2	1	0	0	3	1	4	19	26
12 530.2	1.208	1,*g*								0	19	<25
12 530.6	1.169	2,*u*	2	1	0	3	1	3	1	3	19	38
12 531.6	1.174	2,*g*								3	19	<25
12 531.8	1.182	1,*u*								2	19	<25
12 532.2	1.196	2,*g*								1	19	<25
12 532.3	1.197	2,*u*								1	19	<25
12 533.3	1.186	1,*g*								2	19	<25
12 533.3	1.211	1,*u*								0	19	<25
12 533.7	1.197	$0,g^-$								1	19	<25
12 533.8	1.166	2,*g*	3	0	0	2	2	2	0	3	19	34
12 536.2	1.183	1,*u*								2	19	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 536.3	1.208	1,*u*								0	19	<25
12 536.5	1.162	0,g^+	0	4	0	8	0	0	0	4	20	82
12 537.5	1.164	0,g^+	3	0	0	2	0	2	0	3	19	64
12 538.2	1.197	2,*u*								1	19	<25
12 538.3	1.173	2,*u*								3	19	<25
12 538.4	1.209	1,*g*								0	19	<25
12 538.8	1.184	1,*g*								2	19	<25
12 538.8	1.197	0,u^-								1	19	<25
12 539.1	1.183	1,*u*								2	19	<25
12 540.2	1.175	2,*g*								3	19	<25
12 540.4	1.162	2,*g*	0	4	0	8	2	0	0	4	20	83
12 541.1	1.181	1,*g*								2	19	<25
12 541.5	1.172	0,u^-	0	1	2	1	−1	5	1	3	19	55
12 543.1	1.197	0,u^+								1	19	<25
12 545.4	1.150	0,g^+	1	4	0	0	0	2	0	5	19	66
12 545.5	1.161	1,*u*	0	2	2	0	0	3	1	4	19	40
		1,*u*	0	3	1	1	1	4	0	4	19	40
12 547.8	1.167	1,*u*								3	20	<25
12 547.9	1.197	2,*u*								1	19	<25
12 548.5	1.185	1,*u*								2	19	<25
12 548.6	1.167	1,*g*	1	0	2	5	1	0	0	3	20	32
12 548.8	1.197	2,*g*								1	19	<25
12 550.0	1.164	2,*g*	3	0	0	2	0	2	2	3	19	61
12 552.0	1.152	1,*g*	0	5	0	5	1	0	0	5	20	96
12 554.0	1.163	1,*u*	0	3	1	1	1	4	0	4	19	31
		1,*u*	0	3	1	1	−1	4	2	4	19	57
12 554.1	1.197	0,g^-								1	19	<25
12 554.2	1.172	2,*u*	0	1	2	1	−1	5	3	3	19	26
12 554.8	1.199	0,u^+								1	19	<25
12 555.8	1.197	2,*u*								1	19	<25
12 557.6	1.174	0,u^+	0	2	1	2	2	6	−2	3	19	36
12 558.0	1.150	2,*g*	1	4	0	0	0	2	2	5	19	80
12 558.4	1.185	1,*g*								2	19	<25
12 558.5	1.199	0,g^+								1	19	<25
12 559.3	1.196	0,u^-								1	19	<25
12 560.0	1.183	1,*u*								2	19	<25
12 560.4	1.185	1,*g*								2	19	<25
12 560.5	1.181	0,u^+								2	20	<25
12 560.5	1.181	0,g^+								2	20	<25
12 560.9	1.197	0,g^-								1	19	<25
12 561.1	1.210	1,*g*								0	19	<25
12 561.2	1.176	0,u^+	0	3	0	3	3	7	−3	3	19	43
12 561.5	1.198	0,g^+								1	19	<25
12 561.7	1.197	2,*g*								1	19	<25
12 562.0	1.158	1,*g*	2	2	0	1	−1	2	2	4	19	69
12 562.3	1.185	1,*u*								2	19	<25
12 563.1	1.211	1,*u*								0	19	<25
12 563.1	1.183	1,*g*								2	19	<25
12 564.2	1.158	1,*g*	2	2	0	1	1	2	0	4	19	61
12 564.2	1.197	2,*u*								1	19	<25
12 565.2	1.211	0,g^-								0	18	<25
12 565.3	1.211	0,u^+								0	18	<25
12 565.4	1.174	0,g^+								3	19	<25
12 566.0	1.198	2,*g*								1	19	<25
12 566.8	1.170	0,g^-	2	1	0	2	−2	4	2	3	19	30
		0,g^-	1	1	1	1	−1	5	1	3	19	34
12 567.8	1.182	1,*g*								2	19	<25
12 567.9	1.181	2,*g*								2	20	<25
12 567.9	1.181	2,*u*								2	20	<25
12 568.5	1.183	1,*u*								2	19	<25
12 568.8	1.197	0,u^-	1	0	0	5	−5	9	5	1	19	31
12 570.5	1.198	2,*u*								1	19	<25
12 570.8	1.213	1,*g*								0	19	<25
12 571.0	1.176	2,*u*								3	19	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 571.6	1.161	1,g	1	2	1	0	0	3	1	4	19	55
12 571.6	1.211	2,u								0	18	<25
12 571.6	1.211	2,g								0	18	<25
12 571.7	1.170	0,g^+	2	1	0	2	2	4	−2	3	19	32
		0,g^+	1	1	1	1	1	5	−1	3	19	31
12 572.2	1.185	1,u								2	19	<25
12 573.2	1.198	0,u^+								1	19	<25
12 573.3	1.209	1,u								0	19	<25
12 573.8	1.174	2,u	0	2	1	2	0	6	2	3	19	27
12 575.2	1.197	2,g								1	19	<25
12 575.8	1.196	0,g^-								1	19	<25
12 576.4	1.198	2,g								1	19	<25
12 576.8	1.196	0,g^+								1	19	<25
12 578.0	1.173	0,u^-	1	2	0	3	−1	5	1	3	19	56
12 578.5	1.163	0,u^+	0	4	0	7	1	1	−1	4	20	71
12 578.7	1.198	2,u								1	19	<25
12 579.6	1.172	2,g	1	1	1	1	−1	5	3	3	19	25
12 580.0	1.153	0,g^+	0	5	0	0	0	4	0	5	19	76
12 580.1	1.197	2,g								1	19	<25
12 580.7	1.173	2,g								3	19	<25
12 581.9	1.163	2,u	0	4	0	7	3	1	−1	4	20	50
12 583.3	1.166	0,u^+	2	0	1	0	0	4	0	3	19	45
12 584.0	1.196	0,u^-								1	19	<25
12 585.2	1.197	2,g								1	19	<25
12 585.4	1.197	2,u								1	19	<25
12 585.4	1.210	1,u								0	19	<25
12 585.7	1.198	0,g^+								1	19	<25
12 587.1	1.183	1,u								2	19	<25
12 587.2	1.170	2,g								3	19	<25
12 588.1	1.197	2,u								1	19	<25
12 588.1	1.173	2,u	1	2	0	3	1	5	1	3	19	34
12 589.7	1.170	1,g								3	20	<25
12 590.0	1.170	1,u								3	20	<25
12 590.3	1.197	0,u^+								1	19	<25
12 590.8	1.185	1,u								2	19	<25
12 590.9	1.186	1,g								2	19	<25
12 590.9	1.174	0,u^-	0	2	1	2	−2	6	2	3	19	64
12 591.8	1.154	2,g	0	5	0	0	0	4	2	5	19	81
12 592.6	1.211	1,g								0	19	<25
12 593.9	1.198	0,u^-								1	19	<25
12 594.6	1.186	1,g								2	19	<25
12 597.9	1.167	2,u	2	0	1	0	0	4	2	3	19	45
12 598.3	1.197	2,u								1	19	<25
12 598.4	1.197	2,g								1	19	<25
12 598.6	1.169	0,g^-	2	1	0	2	−2	4	2	3	19	49
		0,g^-	1	1	1	1	−1	5	1	3	19	41
12 599.2	1.211	0,u^-								0	18	<25
12 599.2	1.211	0,g^+								0	18	<25
12 599.6	1.198	0,u^+								1	19	<25
12 600.8	1.210	1,u								0	19	<25
12 602.7	1.162	1,g	1	3	0	1	−1	4	2	4	19	53
12 604.1	1.164	1,g	1	3	0	1	1	4	0	4	19	41
		1,g	0	4	0	1	−1	6	2	4	19	32
12 604.7	1.174	2,u	0	2	1	2	2	6	0	3	19	30
		2,u	0	2	1	2	−2	6	4	3	19	31
12 605.9	1.186	1,u								2	19	<25
12 606.7	1.197	2,u								1	19	<25
12 608.3	1.182	1,g	2	0	0	3	−3	6	4	2	19	34
12 608.6	1.211	2,u								0	18	<25
12 608.6	1.211	2,g								0	18	<25
12 609.2	1.169	2,g	2	1	0	2	−2	4	4	3	19	36
12 610.1	1.209	1,g								0	19	<25
12 610.5	1.197	0,g^-								1	19	<25
12 611.2	1.199	0,g^+								1	19	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 612.0	1.175	$0,g^+$	1	2	0	2	2	6	−2	3	19	32
12 612.1	1.186	$1,u$								2	19	<25
12 613.4	1.184	$1,g$								2	19	<25
12 614.1	1.198	$2,u$								1	19	<25
12 615.4	1.186	$1,u$								2	19	<25
12 617.0	1.184	$1,u$								2	19	<25
12 617.8	1.198	$2,g$								1	19	<25
12 618.9	1.186	$1,g$								2	19	<25
12 620.2	1.211	$1,u$								0	19	<25
12 620.5	1.169	$0,g^+$	2	1	0	2	2	4	−2	3	19	28
		$0,g^+$	2	1	0	2	0	4	0	3	19	47
12 621.1	1.174	$0,g^-$	1	2	0	2	−2	6	2	3	19	50
12 621.2	1.197	$0,g^+$								1	19	<25
12 622.6	1.198	$0,u^+$								1	19	<25
12 622.7	1.184	$1,g$								2	19	<25
12 624.4	1.181	$1,u$								2	19	<25
12 625.0	1.199	$2,g$								1	19	<25
12 625.4	1.174	$0,u^+$	0	2	1	2	2	6	−2	3	19	31
		$0,u^+$	0	2	1	2	0	6	0	3	19	35
12 625.9	1.207	$1,g$	0	0	0	19	1	0	0	0	19	34
12 626.4	1.175	$2,g$								3	19	<25
12 626.9	1.172	$1,g$	0	3	0	11	1	0	0	3	20	29
12 627.4	1.199	$0,u^-$								1	19	<25
12 628.5	1.197	$2,g$								1	19	<25
12 628.5	1.166	$0,u^+$	3	0	0	1	1	3	−1	3	19	61
12 629.3	1.152	$1,u$	3	1	0	0	0	1	1	4	19	88
12 629.8	1.183	$1,g$								2	19	<25
12 630.8	1.177	$0,u^-$	0	3	0	3	−1	7	1	3	19	54
12 631.8	1.163	$0,u^-$	0	4	0	7	−1	1	1	4	20	85
12 632.1	1.211	$1,g$								0	19	<25
12 632.6	1.199	$0,g^-$								1	19	<25
12 632.8	1.169	$2,g$	2	1	0	2	0	4	2	3	19	41
12 634.3	1.198	$2,u$								1	19	<25
12 634.3	1.174	$2,g$								3	19	<25
12 634.6	1.176	$2,u$	0	2	1	2	0	6	2	3	19	26
12 635.7	1.185	$1,u$								2	19	<25
12 635.7	1.196	$1,u$								1	20	<25
12 635.7	1.196	$1,g$								1	20	<25
12 636.6	1.163	$2,u$	0	4	0	7	3	1	−1	4	20	32
		$2,u$	0	4	0	7	1	1	1	4	20	52
12 636.6	1.197	$0,u^+$								1	19	<25
12 637.1	1.186	$1,g$								2	19	<25
12 640.0	1.173	$0,g^+$	0	1	2	0	0	6	0	3	19	55
12 640.1	1.163	$0,g^+$	0	4	0	6	2	2	−2	4	20	34
12 640.7	1.169	$1,u$								3	20	<25
12 640.9	1.197	$2,u$								1	19	<25
12 641.6	1.210	$1,g$								0	19	<25
12 641.9	1.199	$2,u$								1	19	<25
12 642.0	1.164	$0,u^-$	3	0	0	1	−1	3	1	3	19	87
12 642.4	1.165	$2,u$	3	0	0	1	−1	3	3	3	19	51
12 642.6	1.181	$0,g^+$								2	20	<25
12 643.2	1.163	$2,g$	0	4	0	6	4	2	−2	4	20	37
12 643.4	1.181	$0,u^+$								2	20	<25
12 644.0	1.181	$0,u^-$								2	20	<25
12 644.1	1.181	$0,g^-$								2	20	<25
12 644.3	1.176	$2,u$								3	19	<25
12 644.3	1.199	$0,g^+$								1	19	<25
12 645.5	1.166	$1,g$	0	4	0	1	1	6	0	4	19	43
		$1,g$	0	4	0	1	−1	6	2	4	19	37
12 646.2	1.198	$2,g$								1	19	<25
12 647.1	1.168	$1,g$								3	20	<25
12 647.5	1.197	$0,u^-$								1	19	<25
12 647.6	1.183	$1,g$								2	19	<25
12 648.0	1.181	$2,g$								2	20	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 648.6	1.181	2,*u*								2	20	<25
12 650.3	1.208	1,*u*	0	0	0	18	0	1	1	0	19	27
12 650.7	1.153	1,*u*	0	5	0	4	2	1	−1	5	20	61
		1,*u*	0	5	0	4	0	1	1	5	20	31
12 650.8	1.198	$0,g^+$								1	19	<25
12 651.9	1.198	$0,u^-$								1	19	<25
12 652.2	1.181	2,*g*								2	20	<25
12 652.4	1.181	2,*u*								2	20	<25
12 652.9	1.171	1,*u*								3	20	<25
12 653.3	1.197	2,*u*								1	19	<25
12 653.5	1.213	1,*u*								0	19	<25
12 654.1	1.198	2,*g*								1	19	<25
12 654.2	1.173	2,*g*	0	1	2	0	0	6	2	3	19	52
12 654.5	1.169	1,*g*								3	20	<25
12 655.2	1.164	2,*u*	3	0	0	1	1	3	1	3	19	56
		2,*u*	3	0	0	1	−1	3	3	3	19	29
12 655.2	1.172	$0,u^+$	1	1	1	0	0	6	0	3	19	29
12 655.6	1.197	2,*g*								1	19	<25
12 655.7	1.198	$0,g^+$								1	19	<25
12 655.8	1.197	$0,g^-$	1	0	0	4	−4	10	4	1	19	29
12 657.4	1.170	1,*u*	1	1	1	7	1	0	0	3	20	26
12 657.9	1.160	$0,u^+$	0	3	1	6	0	0	0	4	20	58
12 660.1	1.197	$0,g^-$								1	19	<25
12 661.4	1.177	$0,g^-$	1	2	0	2	−2	6	2	3	19	29
		$0,g^-$	0	3	0	2	−2	8	2	3	19	60
12 662.5	1.160	2,*u*	0	3	1	6	2	0	0	4	20	61
12 662.7	1.212	1,*g*								0	19	<25
12 663.9	1.198	2,*u*								1	19	<25
12 664.5	1.183	$0,u^+$								2	20	<25
12 664.5	1.183	$0,g^+$								2	20	<25
12 664.6	1.199	2,*g*								1	19	<25
12 664.7	1.185	1,*g*								2	19	<25
12 665.3	1.170	1,*g*								3	20	<25
12 665.7	1.198	$0,u^+$								1	19	<25
12 667.7	1.170	1,*u*								3	20	<25
12 667.8	1.210	1,*u*								0	19	<25
12 668.1	1.186	1,*u*								2	19	<25
12 669.2	1.186	1,*g*								2	19	<25
12 669.8	1.172	2,*u*	1	1	1	0	0	6	2	3	19	31
12 670.0	1.183	2,*u*								2	20	<25
12 670.0	1.183	2,*g*								2	20	<25
12 671.2	1.152	$0,g^+$	2	0	2	0	0	0	0	4	20	52
		$0,g^+$	0	0	4	0	0	0	0	4	20	35
12 672.1	1.197	2,*g*								1	19	<25
12 673.3	1.198	2,*g*								1	19	<25
12 673.4	1.185	1,*g*								2	19	<25
12 673.4	1.177	2,*g*	0	3	0	2	2	8	0	3	19	28
		2,*g*	0	3	0	2	−2	8	4	3	19	29
12 674.0	1.170	1,*u*								3	20	<25
12 674.5	1.198	2,*u*								1	19	<25
12 674.6	1.186	1,*u*								2	19	<25
12 675.0	1.152	$0,u^+$	1	0	3	0	0	0	0	4	20	71
12 677.8	1.174	$0,g^+$	1	2	0	2	2	6	−2	3	19	32
		$0,g^+$	1	2	0	2	0	6	0	3	19	34
12 677.9	1.212	1,*u*								0	19	<25
12 678.4	1.184	1,*u*								2	19	<25
12 679.0	1.170	1,*g*								3	20	<25
12 680.0	1.163	1,*g*	0	3	1	0	0	5	1	4	19	92
12 680.6	1.200	$0,u^+$								1	19	<25
12 681.1	1.197	$0,u^-$								1	19	<25
12 681.4	1.212	1,*g*								0	19	<25
12 681.9	1.175	$0,g^+$	0	2	1	1	1	7	−1	3	19	60
12 682.4	1.188	1,*u*								2	19	<25
12 684.1	1.164	$0,g^-$	0	4	0	6	−2	2	2	4	20	77

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 684.7	1.162	2,*g*	0	4	0	6	4	2	−2	4	20	37
12 685.1	1.153	1,*u*	0	5	0	4	2	1	−1	5	20	34
		1,*u*	0	5	0	4	0	1	1	5	20	63
12 685.5	1.187	1,*g*								2	19	<25
12 685.6	1.159	$0,g^+$								4	20	<25
12 686.6	1.199	$0,u^+$								1	19	<25
12 688.6	1.198	2,*u*								1	19	<25
12 689.2	1.174	2,*g*	1	2	0	2	0	6	2	3	19	39
12 689.7	1.159	1,*u*	2	2	0	0	0	3	1	4	19	65
12 691.5	1.212	1,*u*								0	19	<25
12 693.0	1.188	1,*g*								2	19	<25
12 693.4	1.199	2,*u*								1	19	<25
12 693.7	1.162	2,*g*	0	4	0	6	0	2	2	4	20	29
12 694.0	1.142	$0,g^+$	0	6	0	2	0	0	0	6	20	100
12 696.0	1.199	$0,g^-$								1	19	<25
12 696.2	1.175	2,*g*	0	2	1	1	1	7	1	3	19	37
		2,*g*	0	2	1	1	−1	7	3	3	19	25
12 697.2	1.142	2,*g*	0	6	0	2	2	0	0	6	20	100
12 697.8	1.184	1,*u*								2	19	<25
12 700.1	1.170	$0,u^+$	2	1	0	1	1	5	−1	3	19	45
		$0,u^+$	1	1	1	0	0	6	0	3	19	48
12 701.7	1.199	2,*u*								1	19	<25
12 701.8	1.197	$0,g^-$								1	19	<25
12 704.6	1.198	2,*g*								1	19	<25
12 704.8	1.172	1,*u*								3	20	<25
12 705.1	1.196	1,*u*								1	20	<25
12 705.1	1.196	1,*g*								1	20	<25
12 705.7	1.182	1,*g*								2	19	<25
12 705.9	1.185	1,*u*								2	19	<25
12 707.0	1.172	1,*g*								3	20	<25
12 707.2	1.175	$0,u^+$	1	2	0	1	1	7	−1	3	19	30
		$0,u^+$	0	3	0	1	1	9	−1	3	19	35
12 707.7	1.185	1,*g*								2	19	<25
12 708.1	1.199	$0,g^+$								1	19	<25
12 708.8	1.199	2,*g*								1	19	<25
12 709.2	1.199	$0,u^-$	0	0	1	2	−2	12	2	1	19	25
12 709.4	1.172	1,*u*								3	20	<25
12 709.6	1.158	$0,u^+$								4	20	<25
12 710.4	1.209	1,*g*								0	19	<25
12 711.0	1.181	$0,g^+$	0	0	2	10	0	0	0	2	20	27
12 711.9	1.181	$0,u^+$	1	0	1	10	0	0	0	2	20	26
12 712.4	1.212	1,*u*								0	19	<25
12 713.9	1.170	2,*u*	2	1	0	1	−1	5	3	3	19	33
		2,*u*	1	1	1	0	0	6	2	3	19	45
12 714.0	1.158	2,*u*								4	20	<25
12 716.1	1.181	2,*g*	0	0	2	10	2	0	0	2	20	27
12 716.5	1.200	$0,u^+$								1	19	<25
12 716.6	1.181	2,*u*								2	20	<25
12 718.0	1.211	1,*g*								0	19	<25
12 718.1	1.212	$0,u^+$								0	20	<25
12 718.1	1.212	$0,g^+$								0	20	<25
12 718.7	1.198	2,*g*								1	19	<25
12 718.9	1.199	$0,g^+$								1	19	<25
12 719.7	1.182	$0,u^-$								2	20	<25
12 719.8	1.199	2,*u*								1	19	<25
12 720.0	1.170	$0,u^-$	2	1	0	1	−1	5	1	3	19	74
12 721.3	1.182	$0,g^-$	1	0	1	9	−1	1	1	2	20	27
12 721.4	1.175	2,*u*								3	19	<25
12 722.9	1.197	$0,u^-$								1	19	<25
12 723.2	1.176	$0,g^-$	0	2	1	1	−1	7	1	3	19	83
12 723.7	1.182	2,*u*								2	20	<25
12 723.9	1.158	$0,g^+$	1	3	0	6	0	0	0	4	20	50
12 724.5	1.182	$0,g^+$								2	20	<25
12 724.6	1.184	1,*u*								2	19	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 725.1	1.197	2,u								1	19	<25
12 725.6	1.182	2,g								2	20	<25
12 725.9	1.171	1,g	0	1	2	7	1	0	0	3	20	26
12 726.2	1.198	0,g^+								1	19	<25
12 726.8	1.158	2,g	1	3	0	6	2	0	0	4	20	50
12 727.2	1.183	0,u^+								2	20	<25
12 727.9	1.182	2,g								2	20	<25
12 728.2	1.161	0,u^+	0	4	0	5	1	3	−1	4	20	28
12 728.3	1.198	0,u^+								1	19	<25
12 728.6	1.198	2,g								1	19	<25
12 729.1	1.162	2,u	0	4	0	5	5	3	−3	4	20	35
12 729.3	1.163	1,u	1	3	0	0	0	5	1	4	19	48
		1,u	0	4	0	0	0	7	1	4	19	28
12 730.0	1.184	0,g^-								2	20	<25
12 730.2	1.184	0,u^-								2	20	<25
12 730.8	1.183	2,u								2	20	<25
12 731.6	1.178	0,g^+	0	3	0	2	2	8	−2	3	19	35
		0,g^+	0	3	0	2	0	8	0	3	19	38
12 732.2	1.212	1,g								0	19	<25
12 732.3	1.212	2,g								0	20	<25
12 732.3	1.212	2,u								0	20	<25
12 732.4	1.186	1,u	0	0	2	0	0	9	1	2	19	32
12 732.5	1.196	1,g								1	20	<25
12 732.5	1.196	1,u								1	20	<25
12 733.1	1.170	2,u	2	1	0	1	1	5	1	3	19	43
		2,u	2	1	0	1	−1	5	3	3	19	30
12 733.6	1.200	2,u								1	19	<25
12 733.8	1.176	2,g	0	2	1	1	1	7	1	3	19	31
		2,g	0	2	1	1	−1	7	3	3	19	35
12 735.2	1.169	1,u	0	2	1	9	1	0	0	3	20	25
12 735.3	1.182	0,g^+								2	20	<25
12 735.6	1.182	0,u^+								2	20	<25
12 736.1	1.171	1,g								3	20	<25
12 736.4	1.199	2,g								1	19	<25
12 737.0	1.187	1,g	0	1	1	2	−2	9	3	2	19	30
12 737.4	1.184	2,u								2	20	<25
12 737.4	1.183	2,g								2	20	<25
12 738.8	1.164	0,g^+	0	4	0	6	2	2	−2	4	20	38
		0,g^+	0	4	0	6	0	2	0	4	20	45
12 739.9	1.187	1,u								2	19	<25
12 740.4	1.171	1,g								3	20	<25
12 740.9	1.198	2,u								1	19	<25
12 741.9	1.172	1,g								3	20	<25
12 742.2	1.212	1,g								0	19	<25
12 743.1	1.182	2,u								2	20	<25
12 743.1	1.185	1,u								2	19	<25
12 743.1	1.182	2,g								2	20	<25
12 743.5	1.185	1,g	1	0	1	0	0	9	1	2	19	34
12 744.4	1.170	1,u								3	20	<25
12 744.4	1.164	2,g	0	4	0	6	2	2	0	4	20	34
		2,g	0	4	0	6	0	2	2	4	20	31
12 744.6	1.165	0,g^+	3	0	0	0	0	4	0	3	19	86
12 744.9	1.199	0,g^-								1	19	<25
12 745.0	1.177	2,g	0	3	0	2	0	8	2	3	19	31
12 746.0	1.168	1,u								3	20	<25
12 747.8	1.158	0,g^+	1	1	2	2	0	0	0	4	20	32
		0,g^+	0	3	1	5	1	1	−1	4	20	34
12 748.2	1.159	2,g	1	1	2	2	2	0	0	4	20	33
		2,g	0	3	1	5	3	1	−1	4	20	27
12 748.8	1.199	0,g^+								1	19	<25
12 750.6	1.200	0,g^-								1	19	<25
12 751.1	1.172	1,g								3	20	<25
12 753.1	1.168	1,g								3	20	<25
12 754.3	1.150	1,u	0	4	1	3	1	0	0	5	20	92

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 754.5	1.164	$0,u^-$	0	4	0	5	−3	3	3	4	20	60
12 754.6	1.199	$0,u^+$								1	19	<25
12 754.8	1.199	$2,g$								1	19	<25
12 754.9	1.162	$2,u$	0	4	0	5	5	3	−3	4	20	28
12 755.3	1.171	$1,g$								3	20	<25
12 755.9	1.177	$0,u^+$	1	2	0	1	1	7	−1	3	19	42
		$0,u^+$	0	3	0	1	1	9	−1	3	19	49
12 756.8	1.182	$0,g^+$								2	20	<25
12 757.0	1.173	$1,u$								3	20	<25
12 757.9	1.188	$1,g$								2	19	<25
12 758.9	1.165	$2,g$	3	0	0	0	0	4	2	3	19	86
12 759.3	1.182	$2,g$								2	20	<25
12 760.9	1.199	$2,u$								1	19	<25
12 761.7	1.199	$2,g$								1	19	<25
12 762.2	1.211	$0,u^-$								0	18	<25
12 762.2	1.211	$0,g^+$								0	18	<25
12 762.2	1.158	$0,u^+$	1	2	1	4	0	0	0	4	20	30
12 763.2	1.168	$1,u$								3	20	<25
12 764.0	1.211	$1,u$								0	19	<25
12 765.5	1.200	$2,g$								1	19	<25
12 766.0	1.160	$2,u$	1	2	1	4	2	0	0	4	20	29
12 766.5	1.198	$0,u^+$								1	19	<25
12 767.0	1.170	$1,u$								3	20	<25
12 767.6	1.182	$2,u$								2	20	<25
12 767.6	1.182	$0,u^+$								2	20	<25
12 767.6	1.161	$0,g^-$	0	3	1	5	−1	1	1	4	20	73
12 767.8	1.154	$1,g$	0	5	0	3	3	2	−2	5	20	49
		$1,g$	0	5	0	3	1	2	0	5	20	28
12 768.0	1.159	$2,g$	0	2	2	4	2	0	0	4	20	31
		$2,g$	0	3	1	5	3	1	−1	4	20	36
12 768.4	1.181	$0,g^+$	1	0	1	9	1	1	−1	2	20	33
12 769.4	1.177	$2,u$	1	2	0	1	−1	7	3	3	19	25
12 769.4	1.159	$0,g^+$	0	2	2	4	0	0	0	4	20	42
		$0,g^+$	0	3	1	5	1	1	−1	4	20	26
12 769.5	1.200	$0,u^-$								1	19	<25
12 769.8	1.211	$2,u$								0	18	<25
12 769.8	1.211	$2,g$								0	18	<25
12 771.0	1.212	$1,u$								0	19	<25
12 771.1	1.181	$2,g$	1	0	1	9	3	1	−1	2	20	25
12 771.4	1.183	$0,u^-$								2	20	<25
12 771.8	1.169	$1,g$	1	0	2	3	3	2	−2	3	20	28
12 773.2	1.187	$1,u$								2	19	<25
12 773.9	1.175	$0,u^-$	1	2	0	1	−1	7	1	3	19	67
12 774.1	1.170	$1,u$								3	20	<25
12 775.1	1.166	$1,u$	1	3	0	0	0	5	1	4	19	29
		$1,u$	0	4	0	0	0	7	1	4	19	68
12 775.3	1.187	$1,u$								2	19	<25
12 776.0	1.197	$1,u$								1	20	<25
12 776.0	1.197	$1,g$								1	20	<25
12 776.2	1.183	$2,u$								2	20	<25
12 776.3	1.199	$2,u$								1	19	<25
12 776.7	1.161	$2,g$	0	3	1	5	1	1	1	4	20	62
12 779.2	1.169	$1,g$								3	20	<25
12 781.9	1.198	$0,u^-$	1	0	0	3	−3	11	3	1	19	38
12 782.5	1.169	$1,u$								3	20	<25
12 783.1	1.184	$1,u$								2	19	<25
12 783.1	1.183	$0,u^-$								2	20	<25
12 783.2	1.199	$2,u$								1	19	<25
12 783.6	1.211	$1,u$								0	19	<25
12 783.7	1.183	$0,u^+$								2	20	<25
12 783.7	1.184	$0,g^+$								2	20	<25
12 784.2	1.183	$2,u$								2	20	<25
12 784.2	1.182	$0,g^-$								2	20	<25
12 784.7	1.184	$2,g$								2	20	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 785.0	1.186	1,g								2	19	<25
12 785.0	1.186	1,u								2	19	<25
12 785.3	1.198	1,u								1	20	<25
12 785.3	1.198	1,g								1	20	<25
12 786.1	1.170	1,g								3	20	<25
12 786.2	1.175	2,u	1	2	0	1	1	7	1	3	19	36
		2,u	1	2	0	1	−1	7	3	3	19	32
12 786.5	1.212	0,u^-								0	20	<25
12 786.5	1.212	0,g^-								0	20	<25
12 787.6	1.182	2,g								2	20	<25
12 787.7	1.184	0,g^-								2	20	<25
12 788.2	1.183	2,u								2	20	<25
12 789.6	1.212	1,g								0	19	<25
12 790.0	1.184	0,u^+								2	20	<25
12 790.9	1.196	1,g								1	20	<25
12 790.9	1.196	1,u								1	20	<25
12 790.9	1.198	0,g^+								1	19	<25
12 791.1	1.171	1,u								3	20	<25
12 791.2	1.184	1,g	1	0	1	0	0	9	1	2	19	30
12 791.4	1.154	1,g	0	5	0	3	3	2	−2	5	20	39
		1,g	0	5	0	3	−1	2	2	5	20	38
12 792.7	1.160	2,u	1	3	0	5	3	1	−1	4	20	30
12 792.7	1.171	1,g								3	20	<25
12 792.7	1.160	0,u^+	1	2	1	4	0	0	0	4	20	34
12 792.9	1.184	2,g								2	20	<25
12 793.2	1.198	2,g								1	19	<25
12 793.2	1.199	0,u^-								1	19	<25
12 793.3	1.199	2,u								1	19	<25
12 794.2	1.199	0,g^-								1	19	<25
12 794.3	1.213	1,u								0	19	<25
12 794.5	1.181	0,u^+								2	20	<25
12 794.7	1.212	2,u								0	20	<25
12 794.7	1.212	2,g								0	20	<25
12 795.0	1.182	2,u								2	20	<25
12 797.9	1.182	0,g^+								2	20	<25
12 798.3	1.164	0,u^+	0	4	0	5	3	3	−3	4	20	35
		0,u^+	0	4	0	5	1	3	−1	4	20	39
12 798.7	1.199	0,g^+								1	19	<25
12 800.2	1.200	0,u^+								1	19	<25
12 800.7	1.199	2,u								1	19	<25
12 801.0	1.182	2,g								2	20	<25
12 801.8	1.171	1,u								3	20	<25
12 802.2	1.182	2,u								2	20	<25
12 802.3	1.163	2,u	0	4	0	5	3	3	−1	4	20	36
12 802.5	1.183	0,g^+								2	20	<25
12 803.1	1.173	1,g								3	20	<25
12 803.5	1.161	0,u^-	1	3	0	5	−1	1	1	4	20	34
12 804.4	1.150	1,g	1	4	0	3	1	0	0	5	20	78
12 805.7	1.201	0,g^+	0	0	1	1	1	13	−1	1	19	27
12 806.9	1.184	0,u^+								2	20	<25
12 807.6	1.171	1,u								3	20	<25
12 808.3	1.198	2,g								1	19	<25
12 809.2	1.187	1,g								2	19	<25
12 810.0	1.183	0,g^+								2	20	<25
12 810.4	1.199	2,g								1	19	<25
12 810.8	1.183	2,g								2	20	<25
12 811.1	1.176	0,u^+	0	2	1	0	0	8	0	3	19	86
12 811.2	1.160	2,u	0	2	2	3	3	1	−1	4	20	34
12 811.3	1.172	1,u								3	20	<25
12 811.3	1.171	0,g^+	2	1	0	0	0	6	0	3	19	60
12 811.5	1.212	1,g								0	19	<25
12 811.6	1.161	0,g^+								4	20	<25
12 812.0	1.183	0,u^+	0	1	1	12	0	0	0	2	20	28
12 812.0	1.160	0,u^+	0	2	2	3	1	1	−1	4	20	33

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,u^+$	1	3	0	5	1	1	−1	4	20	40
12 812.7	1.212	1,*u*								0	19	<25
12 812.9	1.184	2,*u*								2	20	<25
12 813.2	1.171	1,*u*								3	20	<25
12 813.3	1.184	2,*g*								2	20	<25
12 814.5	1.200	2,*u*								1	19	<25
12 814.5	1.161	2,*u*								4	20	<25
12 814.6	1.171	1,*g*	1	2	0	7	3	2	−2	3	20	26
12 815.3	1.183	2,*u*								2	20	<25
12 815.6	1.184	2,*g*								2	20	<25
12 816.0	1.196	1,*g*								1	20	<25
12 816.1	1.196	1,*u*								1	20	<25
12 816.8	1.200	2,*g*								1	19	<25
12 816.9	1.171	1,*u*								3	20	<25
12 816.9	1.182	$0,u^+$								2	20	<25
12 817.4	1.188	1,*g*								2	19	<25
12 818.0	1.184	$0,g^+$								2	20	<25
12 818.3	1.170	1,*g*								3	20	<25
12 819.8	1.183	$0,u^-$								2	20	<25
12 821.6	1.198	$0,g^-$	1	0	0	2	−2	12	2	1	19	33
12 821.8	1.183	2,*u*								2	20	<25
12 824.0	1.211	1,*g*								0	19	<25
12 824.0	1.177	2,*u*	0	2	1	0	0	8	2	3	19	82
12 824.1	1.183	2,*u*								2	20	<25
12 824.6	1.161	2,*g*								4	20	<25
12 824.7	1.190	1,*u*	0	2	0	2	−2	11	3	2	19	27
12 825.4	1.171	2,*g*	2	1	0	0	0	6	2	3	19	62
12 826.0	1.183	$0,g^-$								2	20	<25
12 827.3	1.154	1,*g*	0	5	0	3	1	2	0	5	20	56
		1,*g*	0	5	0	3	−1	2	2	5	20	32
12 827.6	1.179	$0,u^-$	0	3	0	1	−1	9	1	3	19	76
12 828.2	1.184	$0,g^-$								2	20	<25
12 828.4	1.183	$0,g^+$								2	20	<25
12 828.7	1.183	2,*g*								2	20	<25
12 830.0	1.183	$0,u^-$								2	20	<25
12 830.6	1.172	1,*u*								3	20	<25
12 832.8	1.184	$0,u^-$	0	1	1	10	−2	2	2	2	20	31
12 833.4	1.212	1,*g*								0	19	<25
12 833.5	1.183	2,*g*								2	20	<25
12 833.8	1.199	2,*g*								1	19	<25
12 833.9	1.183	2,*u*								2	20	<25
12 836.0	1.211	$0,u^+$								0	20	<25
12 836.0	1.211	$0,g^+$								0	20	<25
12 836.2	1.200	$0,u^-$								1	19	<25
12 836.6	1.182	$0,g^+$								2	20	<25
12 836.7	1.183	2,*g*								2	20	<25
12 836.7	1.160	$0,u^-$	0	2	2	3	−1	1	1	4	20	28
		$0,u^-$	1	3	0	5	−1	1	1	4	20	46
12 837.2	1.198	1,*u*								1	20	<25
12 837.2	1.198	1,*g*								1	20	<25
12 837.7	1.173	1,*u*								3	20	<25
12 837.7	1.161	$0,g^-$								4	20	<25
12 838.0	1.161	$0,g^+$								4	20	<25
12 838.7	1.183	2,*g*								2	20	<25
12 838.8	1.183	2,*u*								2	20	<25
12 838.9	1.182	$0,u^+$								2	20	<25
12 839.8	1.170	1,*g*								3	20	<25
12 840.5	1.178	2,*u*	0	3	0	1	1	9	1	3	19	33
		2,*u*	0	3	0	1	−1	9	3	3	19	40
12 840.9	1.183	2,*u*								2	20	<25
12 841.3	1.183	$0,g^-$								2	20	<25
12 841.8	1.200	$0,g^+$								1	19	<25
12 842.1	1.169	1,*g*								3	20	<25
12 842.2	1.175	1,*u*								3	20	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 842.4	1.160	2,u	1	3	0	5	1	1	1	4	20	36
12 842.4	1.183	2,g								2	20	<25
12 844.8	1.183	0,u^-								2	20	<25
12 845.3	1.174	1,u								3	20	<25
12 845.5	1.170	1,g								3	20	<25
12 846.2	1.211	2,g								0	20	<25
12 846.2	1.211	2,u								0	20	<25
12 846.3	1.200	2,u								1	19	<25
12 847.6	1.183	0,u^+								2	20	<25
12 847.7	1.212	1,g								0	19	<25
12 848.6	1.183	2,g								2	20	<25
12 849.1	1.171	1,g	1	2	0	7	−1	2	2	3	20	27
12 849.2	1.197	1,g								1	20	<25
12 849.5	1.183	2,u								2	20	<25
12 849.6	1.185	1,g								2	19	<25
12 849.7	1.197	1,u								1	20	<25
12 849.7	1.199	0,u^+								1	19	<25
12 850.2	1.200	2,g								1	19	<25
12 850.5	1.183	0,g^-								2	20	<25
12 851.0	1.160	2,g	1	2	1	3	3	1	−1	4	20	37
12 851.4	1.213	1,u								0	19	<25
12 851.4	1.161	0,g^-	0	4	0	4	−4	4	4	4	20	36
12 851.9	1.212	0,u^+								0	20	<25
12 851.9	1.212	0,g^+								0	20	<25
12 851.9	1.182	0,g^+	0	2	0	14	0	0	0	2	20	25
12 852.0	1.183	2,u								2	20	<25
12 852.6	1.168	1,g								3	20	<25
12 853.2	1.165	0,u^-	0	4	0	5	−1	3	1	4	20	70
12 854.1	1.161	2,g								4	20	<25
12 854.1	1.196	1,u								1	20	<25
12 854.1	1.157	0,u^+	1	1	2	1	1	1	−1	4	20	54
12 855.0	1.197	1,g								1	20	<25
12 855.2	1.158	0,g^+	0	1	3	1	1	1	−1	4	20	37
12 855.4	1.187	1,g								2	19	<25
12 856.1	1.199	2,u								1	19	<25
12 856.6	1.184	0,g^+								2	20	<25
12 856.8	1.143	0,u^+	0	6	0	1	1	1	−1	6	20	98
12 856.9	1.175	1,g								3	20	<25
12 857.5	1.186	1,u								2	19	<25
12 857.6	1.171	1,u								3	20	<25
12 858.1	1.198	0,u^-								1	19	<25
12 858.3	1.182	0,u^-								2	20	<25
12 859.3	1.169	1,u								3	20	<25
12 859.4	1.182	2,g								2	20	<25
12 859.4	1.200	0,g^+								1	19	<25
12 859.7	1.164	2,u	0	4	0	5	1	3	1	4	20	29
12 860.1	1.185	0,u^+								2	20	<25
12 860.7	1.162	2,u	0	3	1	4	4	2	−2	4	20	28
12 860.8	1.171	1,g								3	20	<25
12 861.0	1.175	0,g^+	1	2	0	0	0	8	0	3	19	45
		0,g^+	0	3	0	0	0	10	0	3	19	26
12 861.2	1.183	2,u								2	20	<25
12 861.6	1.183	2,g								2	20	<25
12 862.7	1.200	0,u^+	1	0	0	1	1	13	−1	1	19	31
12 864.1	1.197	1,u								1	20	<25
12 864.2	1.197	1,g								1	20	<25
12 864.9	1.197	1,u								1	20	<25
12 865.0	1.183	0,u^+								2	20	<25
12 865.2	1.197	1,g								1	20	<25
12 866.0	1.183	2,g								2	20	<25
12 866.9	1.200	0,g^-								1	19	<25
12 867.1	1.183	0,g^-								2	20	<25
12 867.3	1.183	0,g^+								2	20	<25
12 867.3	1.159	0,u^-	1	1	2	1	−1	1	1	4	20	41

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,u^-$	0	3	1	4	−2	2	2	4	20	43
12 867.7	1.198	$2,u$	1	0	0	1	1	13	1	1	19	25
12 867.9	1.212	$2,g$								0	20	<25
12 867.9	1.212	$2,u$								0	20	<25
12 868.1	1.200	$2,g$								1	19	<25
12 868.4	1.159	$0,u^+$	0	2	2	3	1	1	−1	4	20	32
12 870.3	1.188	$1,u$	0	1	1	1	1	10	0	2	19	27
		$1,u$	0	1	1	1	−1	10	2	2	19	29
12 870.5	1.184	$2,g$								2	20	<25
12 870.5	1.143	$0,u^-$	0	6	0	1	−1	1	1	6	20	100
12 870.6	1.190	$1,g$	0	2	0	1	−1	12	2	2	19	27
12 870.6	1.184	$2,u$								2	20	<25
12 870.7	1.170	$1,g$								3	20	<25
12 871.6	1.150	$1,g$	0	3	2	1	1	0	0	5	20	26
		$1,g$	0	4	1	2	2	1	−1	5	20	47
12 872.3	1.158	$2,u$	1	1	2	1	1	1	1	4	20	43
12 873.3	1.165	$0,g^+$	0	4	0	4	4	4	−4	4	20	49
12 873.7	1.183	$2,u$								2	20	<25
12 873.8	1.184	$0,u^+$								2	20	<25
12 874.2	1.183	$0,u^-$								2	20	<25
12 874.3	1.161	$2,g$								4	20	<25
12 874.3	1.172	$1,u$	1	2	0	6	4	3	−3	3	20	26
12 874.5	1.175	$2,g$	1	2	0	0	0	8	2	3	19	46
		$2,g$	0	3	0	0	0	10	2	3	19	25
12 875.5	1.170	$1,g$								3	20	<25
12 875.9	1.200	$2,u$								1	19	<25
12 876.7	1.183	$2,u$								2	20	<25
12 876.7	1.184	$2,g$	1	1	0	8	6	4	−4	2	20	28
12 877.2	1.159	$0,g^-$	1	2	1	3	−1	1	1	4	20	34
12 878.2	1.169	$1,g$								3	20	<25
12 878.3	1.143	$2,u$	0	6	0	1	1	1	1	6	20	100
12 878.5	1.196	$1,u$								1	20	<25
12 878.8	1.172	$1,u$								3	20	<25
12 879.3	1.183	$0,u^+$								2	20	<25
12 879.4	1.183	$0,g^+$								2	20	<25
12 880.3	1.170	$1,u$								3	20	<25
12 880.7	1.184	$0,g^-$								2	20	<25
12 881.9	1.183	$2,g$								2	20	<25
12 881.9	1.200	$2,g$								1	19	<25
12 882.0	1.212	$1,u$								0	19	<25
12 882.4	1.196	$1,g$								1	20	<25
12 882.5	1.184	$0,g^+$								2	20	<25
12 882.7	1.183	$2,u$								2	20	<25
12 882.8	1.200	$0,u^-$								1	19	<25
12 883.0	1.171	$1,u$								3	20	<25
12 884.1	1.162	$0,u^+$	0	3	1	4	2	2	−2	4	20	31
		$0,u^+$	0	3	1	4	0	2	0	4	20	48
12 885.0	1.161	$2,g$								4	20	<25
12 885.0	1.200	$0,g^+$								1	19	<25
12 885.1	1.158	$0,u^-$	1	1	2	1	−1	1	1	4	20	37
		$0,u^-$	0	2	2	3	−1	1	1	4	20	34
12 885.5	1.184	$2,u$								2	20	<25
12 885.5	1.185	$0,u^-$								2	20	<25
12 885.9	1.159	$2,u$	0	3	1	4	2	2	0	4	20	29
12 886.0	1.171	$1,g$								3	20	<25
12 887.4	1.200	$0,u^+$	0	1	0	1	1	15	−1	1	19	25
12 889.8	1.185	$0,u^-$								2	20	<25
12 890.8	1.211	$0,u^-$								0	20	<25
12 890.8	1.211	$0,g^-$								0	20	<25
12 891.1	1.212	$1,u$	0	0	0	2	−2	17	3	0	19	27
12 891.3	1.172	$1,u$								3	20	<25
12 891.6	1.169	$1,g$								3	20	<25
12 891.8	1.184	$0,g^-$								2	20	<25
12 892.0	1.161	$2,g$	1	3	0	4	4	2	−2	4	20	54

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 892.1	1.196	1,g								1	20	<25
12 892.2	1.200	2,u								1	19	<25
12 893.1	1.160	0,g^+	1	3	0	4	2	2	−2	4	20	31
12 894.1	1.201	2,g								1	19	<25
12 894.4	1.170	1,g								3	20	<25
12 894.5	1.183	0,g^-								2	20	<25
12 894.7	1.184	2,u								2	20	<25
12 894.7	1.183	2,g								2	20	<25
12 894.9	1.211	2,u								0	20	<25
12 894.9	1.211	2,g								0	20	<25
12 895.2	1.162	2,u	0	3	1	4	0	2	2	4	20	55
12 895.4	1.183	0,u^-								2	20	<25
12 895.6	1.184	2,g								2	20	<25
12 895.9	1.196	1,u								1	20	<25
12 896.2	1.196	1,g								1	20	<25
12 896.3	1.196	1,u								1	20	<25
12 898.3	1.172	1,g								3	20	<25
12 898.7	1.184	0,u^+								2	20	<25
12 898.8	1.197	1,u								1	20	<25
12 899.0	1.151	1,g	0	4	1	2	2	1	−1	5	20	32
		1,g	0	4	1	2	0	1	1	5	20	60
12 899.7	1.197	1,g								1	20	<25
12 900.4	1.157	0,g^+	2	2	0	4	0	0	0	4	20	48
12 900.6	1.184	2,u								2	20	<25
12 900.6	1.170	1,u								3	20	<25
12 900.8	1.197	1,g								1	20	<25
12 900.9	1.184	0,g^+								2	20	<25
12 901.4	1.200	2,u								1	19	<25
12 901.4	1.184	1,u	2	0	0	0	0	9	1	2	19	59
12 901.4	1.172	1,g								3	20	<25
12 902.4	1.157	2,g	2	2	0	4	2	0	0	4	20	61
12 902.6	1.184	2,g								2	20	<25
12 902.8	1.171	1,u								3	20	<25
12 902.8	1.197	1,u								1	20	<25
12 904.5	1.183	0,u^+								2	20	<25
12 904.7	1.184	2,u								2	20	<25
12 905.6	1.196	1,g								1	20	<25
12 905.7	1.171	1,g								3	20	<25
12 905.7	1.183	0,u^-								2	20	<25
12 906.2	1.184	0,g^-	1	1	0	8	−4	4	4	2	20	31
12 906.4	1.172	1,u								3	20	<25
12 906.5	1.214	1,g	0	0	0	1	1	18	0	0	19	26
12 906.5	1.183	2,u								2	20	<25
12 906.7	1.151	1,u								5	20	<25
12 907.0	1.183	2,g								2	20	<25
12 907.2	1.161	0,g^-	1	2	1	3	−1	1	1	4	20	28
		0,g^-	1	3	0	4	−2	2	2	4	20	36
12 907.6	1.183	0,g^+								2	20	<25
12 908.3	1.189	1,g	0	1	1	0	0	11	1	2	19	69
12 909.7	1.184	2,g								2	20	<25
12 910.5	1.182	0,g^+								2	20	<25
12 911.3	1.171	1,u								3	20	<25
12 911.8	1.195	1,u								1	20	<25
12 911.9	1.184	0,u^+								2	20	<25
12 912.2	1.184	2,g								2	20	<25
12 912.8	1.182	2,u								2	20	<25
12 912.8	1.199	0,g^-	0	0	1	1	−1	13	1	1	19	30
12 913.2	1.161	2,g	1	3	0	4	2	2	0	4	20	28
12 913.3	1.183	0,g^-								2	20	<25
12 913.9	1.196	1,g								1	20	<25
12 914.1	1.149	1,g	0	3	2	1	1	0	0	5	20	60
12 914.6	1.174	1,g								3	20	<25
12 915.0	1.184	2,g								2	20	<25
12 915.3	1.179	0,g^+	1	2	0	0	0	8	0	3	19	28

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,g^+$	0	3	0	0	0	10	0	3	19	66
12 916.1	1.184	$2,u$								2	20	<25
12 916.6	1.160	$0,g^+$								4	20	<25
12 917.6	1.197	$1,u$								1	20	<25
12 917.6	1.184	$0,u^+$								2	20	<25
12 917.9	1.184	$0,g^+$								2	20	<25
12 918.2	1.165	$0,g^-$	0	4	0	4	−2	4	2	4	20	61
12 919.1	1.184	$0,u^-$								2	20	<25
12 919.3	1.152	$0,g^+$	2	0	2	0	0	0	0	4	20	32
		$0,g^+$	0	0	4	0	0	0	0	4	20	57
12 919.6	1.182	$2,g$								2	20	<25
12 919.8	1.184	$2,u$								2	20	<25
12 919.9	1.199	$0,g^+$								1	19	<25
12 920.2	1.183	$0,g^+$								2	20	<25
12 920.3	1.200	$2,g$								1	19	<25
12 921.4	1.190	$1,u$	0	2	0	0	0	13	1	2	19	31
12 921.4	1.156	$0,u^+$	2	1	1	2	0	0	0	4	20	42
12 921.6	1.196	$1,u$								1	20	<25
12 922.4	1.196	$1,g$								1	20	<25
12 922.7	1.184	$0,u^+$								2	20	<25
12 923.2	1.200	$0,u^-$								1	19	<25
12 924.7	1.164	$2,g$								4	20	<25
12 924.7	1.152	$1,u$	1	3	1	1	1	0	0	5	20	31
		$1,u$	0	5	0	2	−2	3	3	5	20	26
12 925.1	1.183	$0,u^+$								2	20	<25
12 925.5	1.155	$2,u$	2	1	1	2	2	0	0	4	20	53
		$2,u$	0	1	3	2	2	0	0	4	20	26
12 925.5	1.187	$1,g$	1	1	0	1	1	10	0	2	19	33
		$1,g$	1	1	0	1	−1	10	2	2	19	29
12 925.6	1.199	$0,g^-$	1	0	0	2	−2	12	2	1	19	25
12 925.6	1.161	$0,g^+$	1	3	0	4	0	2	0	4	20	33
12 925.7	1.184	$2,u$								2	20	<25
12 926.0	1.169	$1,u$								3	20	<25
12 926.0	1.183	$2,g$								2	20	<25
12 927.4	1.184	$0,u^-$	0	0	2	5	−5	5	5	2	20	29
12 927.6	1.173	$1,g$								3	20	<25
12 928.0	1.183	$2,g$								2	20	<25
12 928.0	1.196	$1,u$								1	20	<25
12 928.3	1.179	$2,g$	1	2	0	0	0	8	2	3	19	28
		$2,g$	0	3	0	0	0	10	2	3	19	66
12 929.1	1.184	$2,u$								2	20	<25
12 929.2	1.212	$2,u$								0	20	<25
12 929.2	1.161	$0,g^-$	0	2	2	2	−2	2	2	4	20	40
12 929.3	1.212	$2,g$								0	20	<25
12 929.4	1.212	$0,u^-$								0	20	<25
12 929.4	1.212	$0,g^-$								0	20	<25
12 930.0	1.169	$1,u$								3	20	<25
12 930.2	1.160	$0,u^+$								4	20	<25
12 930.7	1.196	$1,g$								1	20	<25
12 931.2	1.199	$2,g$								1	19	<25
12 931.3	1.173	$1,g$								3	20	<25
12 931.9	1.170	$1,u$								3	20	<25
12 932.0	1.184	$0,g^+$								2	20	<25
12 932.6	1.197	$1,g$								1	20	<25
12 932.6	1.184	$2,u$								2	20	<25
12 932.9	1.199	$0,u^+$	0	0	1	0	0	14	0	1	19	35
12 933.1	1.200	$2,u$								1	19	<25
12 933.1	1.211	$0,u^+$								0	20	<25
12 933.1	1.211	$0,g^+$								0	20	<25
12 934.1	1.161	$2,g$	0	2	2	2	2	2	0	4	20	28
12 934.4	1.185	$0,u^+$								2	20	<25
12 934.6	1.183	$2,u$								2	20	<25
12 935.8	1.183	$0,g^+$								2	20	<25
12 936.8	1.202	$0,u^+$	0	1	0	1	1	15	−1	1	19	32

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 937.0	1.153	1,u	0	5	0	2	2	3	−1	5	20	34
		1,u	0	5	0	2	−2	3	3	5	20	26
12 937.8	1.183	2,g								2	20	<25
12 938.2	1.212	2,u								0	20	<25
12 938.2	1.197	1,u								1	20	<25
12 938.4	1.212	2,g								0	20	<25
12 938.7	1.199	2,g								1	19	<25
12 938.8	1.162	2,g	1	3	0	4	2	2	0	4	20	30
12 939.0	1.176	1,g								3	20	<25
12 939.2	1.172	1,u								3	20	<25
12 940.1	1.183	2,g								2	20	<25
12 940.4	1.184	0,u^+								2	20	<25
12 940.5	1.172	1,u								3	20	<25
12 940.5	1.196	1,g								1	20	<25
12 940.7	1.185	0,g^-								2	20	<25
12 941.4	1.212	1,g								0	19	<25
12 941.5	1.164	1,g	3	0	0	5	1	0	0	3	20	61
12 941.5	1.196	1,u								1	20	<25
12 941.8	1.185	0,u^-								2	20	<25
12 941.9	1.197	1,g								1	20	<25
12 943.1	1.212	1,u								0	19	<25
12 943.5	1.212	1,g								0	19	<25
12 945.1	1.200	2,u	0	0	1	0	0	14	2	1	19	39
12 945.2	1.184	0,g^+								2	20	<25
12 945.6	1.184	0,g^-								2	20	<25
12 945.7	1.175	1,g								3	20	<25
12 946.4	1.197	1,u								1	20	<25
12 946.6	1.198	1,g								1	20	<25
12 946.7	1.161	2,u								4	20	<25
12 946.9	1.171	1,g								3	20	<25
12 947.4	1.183	2,u								2	20	<25
12 947.7	1.184	0,g^+								2	20	<25
12 948.1	1.183	0,u^+								2	20	<25
12 948.4	1.184	2,g								2	20	<25
12 948.4	1.171	1,u								3	20	<25
12 948.6	1.201	2,u								1	19	<25
12 948.7	1.184	2,u								2	20	<25
12 949.3	1.151	1,u	1	4	0	2	2	1	−1	5	20	48
12 949.3	1.172	1,u								3	20	<25
12 950.4	1.150	1,u	1	4	0	2	0	1	1	5	20	68
12 951.4	1.184	2,g								2	20	<25
12 951.5	1.196	1,u								1	20	<25
12 951.7	1.183	0,u^-								2	20	<25
12 952.4	1.182	0,g^+								2	20	<25
12 952.8	1.183	2,g								2	20	<25
12 953.1	1.183	2,u								2	20	<25
12 953.1	1.183	0,u^-								2	20	<25
12 953.7	1.196	1,g								1	20	<25
12 953.7	1.173	1,g	1	2	0	5	5	4	−4	3	20	26
12 954.0	1.196	1,u								1	20	<25
12 954.6	1.161	0,g^+								4	20	<25
12 955.2	1.170	1,u								3	20	<25
12 955.2	1.211	0,u^+								0	20	<25
12 955.2	1.211	0,g^+								0	20	<25
12 955.3	1.160	0,u^-	1	2	1	2	−2	2	2	4	20	49
12 955.5	1.183	2,u								2	20	<25
12 955.9	1.184	2,g								2	20	<25
12 956.3	1.184	0,g^-	1	0	1	5	−5	5	5	2	20	29
12 957.3	1.182	2,u								2	20	<25
12 958.1	1.176	1,u								3	20	<25
12 959.5	1.201	0,g^+	1	0	0	0	0	14	0	1	19	35
		0,g^+	0	1	0	0	0	16	0	1	19	26
12 960.0	1.196	1,g								1	20	<25
12 960.7	1.183	0,u^+								2	20	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 963.4	1.161	2,*g*	0	2	2	2	0	2	2	4	20	28
12 963.6	1.211	2,*u*	0	0	0	11	11	9	−9	0	20	47
12 963.8	1.164	0,u^+	0	4	0	3	1	5	−1	4	20	34
12 964.3	1.183	2,*u*								2	20	<25
12 964.6	1.184	2,*g*								2	20	<25
12 964.7	1.212	1,*u*								0	19	<25
12 964.8	1.197	1,*u*								1	20	<25
12 964.9	1.196	1,*g*								1	20	<25
12 965.4	1.212	1,*g*								0	19	<25
12 965.9	1.188	1,*u*	1	1	0	0	0	11	1	2	19	52
12 966.2	1.183	0,u^+								2	20	<25
12 967.4	1.211	2,*g*								0	20	<25
12 967.8	1.181	0,g^-	2	0	0	8	−2	2	2	2	20	28
12 968.6	1.172	1,*g*								3	20	<25
12 969.3	1.197	1,*u*								1	20	<25
12 969.4	1.211	0,u^-								0	20	<25
12 969.4	1.211	0,g^-	0	0	0	10	−8	10	8	0	20	27
12 969.7	1.171	1,*g*								3	20	<25
12 970.9	1.184	2,*u*								2	20	<25
12 971.0	1.184	0,g^+								2	20	<25
12 971.3	1.173	1,*u*								3	20	<25
12 971.5	1.201	2,*g*	1	0	0	0	0	14	2	1	19	33
12 972.1	1.185	0,g^+								2	20	<25
12 972.2	1.197	1,*g*								1	20	<25
12 972.2	1.185	0,g^-								2	20	<25
12 972.5	1.183	2,*g*								2	20	<25
12 972.7	1.166	0,g^+	0	4	0	4	2	4	−2	4	20	39
		0,g^+	0	4	0	4	0	4	0	4	20	40
12 973.7	1.198	1,*u*								1	20	<25
12 974.2	1.161	0,g^+								4	20	<25
12 974.3	1.183	2,*g*								2	20	<25
12 974.5	1.185	0,u^+								2	20	<25
12 975.9	1.169	1,*g*								3	20	<25
12 976.0	1.185	0,u^-								2	20	<25
12 976.1	1.215	1,*u*	0	0	0	0	0	19	1	0	19	49
12 976.1	1.198	1,*g*								1	20	<25
12 976.3	1.155	1,*u*	0	5	0	2	0	3	1	5	20	57
12 976.3	1.211	2,*u*								0	20	<25
12 977.0	1.185	2,*u*								2	20	<25
12 977.2	1.162	2,*u*								4	20	<25
12 977.6	1.197	1,*u*								1	20	<25
12 977.6	1.211	2,*g*								0	20	<25
12 977.6	1.172	1,*g*								3	20	<25
12 978.0	1.159	0,u^+	0	1	3	0	0	2	0	4	20	25
12 978.6	1.200	0,u^-	1	0	0	1	−1	13	1	1	19	29
12 978.7	1.185	0,u^+								2	20	<25
12 979.5	1.172	1,*g*								3	20	<25
12 980.3	1.198	1,*g*								1	20	<25
12 980.4	1.166	2,*g*	0	4	0	4	2	4	0	4	20	31
		2,*g*	0	4	0	4	0	4	2	4	20	36
12 980.5	1.185	0,g^+								2	20	<25
12 980.8	1.197	1,*u*								1	20	<25
12 981.2	1.183	0,u^-								2	20	<25
12 981.5	1.161	0,g^-	0	2	2	2	−2	2	2	4	20	33
		0,g^-	0	3	1	3	−3	3	3	4	20	46
12 982.1	1.169	1,*u*								3	20	<25
12 982.1	1.183	2,*g*								2	20	<25
12 983.1	1.161	2,*u*	1	2	1	2	0	2	2	4	20	31
12 983.1	1.185	0,u^+								2	20	<25
12 983.1	1.140	0,u^+	0	5	1	0	0	0	0	6	20	98
12 983.5	1.185	2,*u*								2	20	<25
12 983.5	1.184	0,g^-								2	20	<25
12 984.1	1.197	1,*u*								1	20	<25
12 984.1	1.184	0,g^+								2	20	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
12 984.7	1.185	2,g								2	20	<25
12 984.8	1.197	1,g								1	20	<25
12 985.4	1.169	1,u								3	20	<25
12 985.8	1.211	2,u								0	20	<25
12 986.2	1.184	2,g								2	20	<25
12 986.5	1.161	2,g	0	2	2	2	2	2	0	4	20	32
		2,g	0	3	1	3	3	3	−1	4	20	32
12 987.9	1.183	0,u^-								2	20	<25
12 988.0	1.185	2,u								2	20	<25
12 988.5	1.170	1,u								3	20	<25
12 988.9	1.174	1,g								3	20	<25
12 989.2	1.199	2,u								1	19	<25
12 989.7	1.197	1,g								1	20	<25
12 989.9	1.185	2,u								2	20	<25
12 990.3	1.191	1,g	0	2	0	1	1	12	0	2	19	29
		1,g	0	2	0	1	−1	12	2	2	19	29
12 990.3	1.164	0,u^-	0	4	0	3	−3	5	3	4	20	50
12 990.6	1.184	2,g								2	20	<25
12 990.9	1.172	1,u								3	20	<25
12 991.1	1.160	0,g^+	1	1	2	0	0	2	0	4	20	28
12 991.3	1.183	2,u								2	20	<25
12 991.8	1.212	0,u^+								0	20	<25
12 991.8	1.212	0,g^+								0	20	<25
12 991.9	1.171	1,g								3	20	<25
12 991.9	1.158	0,u^+								4	20	<25
12 992.2	1.197	1,u								1	20	<25
12 993.1	1.184	0,u^+								2	20	<25
12 994.7	1.184	2,g								2	20	<25
12 994.7	1.196	1,g								1	20	<25
12 994.8	1.185	0,g^-								2	20	<25
12 995.9	1.184	0,u^-								2	20	<25
12 996.6	1.196	1,u								1	20	<25
12 996.9	1.200	0,g^-								1	19	<25
12 997.5	1.184	2,u								2	20	<25
12 998.0	1.211	2,g								0	20	<25
12 998.1	1.200	0,u^+								1	19	<25
12 998.2	1.185	2,g								2	20	<25
12 998.4	1.196	1,u								1	20	<25
12 998.7	1.185	0,g^+								2	20	<25
12 998.9	1.160	2,u	2	2	0	3	3	1	−1	4	20	53
12 999.3	1.212	0,u^+	0	0	0	11	9	9	−9	0	20	31
12 999.4	1.212	0,g^+								0	20	<25
12 999.8	1.175	1,u								3	20	<25
13 000.1	1.185	0,g^+								2	20	<25
13 000.3	1.173	1,u								3	20	<25
13 000.4	1.173	1,g								3	20	<25
13 000.8	1.196	1,g								1	20	<25
13 001.4	1.185	2,g								2	20	<25
13 001.4	1.158	0,g^+	1	1	2	0	0	2	0	4	20	39
13 002.1	1.161	2,g								4	20	<25
13 003.1	1.158	0,u^+	2	2	0	3	1	1	−1	4	20	48
13 003.3	1.197	1,u								1	20	<25
13 003.6	1.159	2,u	0	1	3	0	0	2	2	4	20	40
13 003.9	1.197	1,g								1	20	<25
13 004.0	1.213	1,u								0	19	<25
13 004.3	1.169	1,u	0	0	3	1	−1	4	2	3	20	27
13 004.6	1.163	0,g^-	0	3	1	3	−1	3	1	4	20	74
13 005.0	1.213	1,g								0	19	<25
13 005.1	1.184	0,u^-								2	20	<25
13 005.2	1.162	0,u^+	1	3	0	3	3	3	−3	4	20	34
		0,u^+	1	3	0	3	1	3	−1	4	20	31
13 005.5	1.200	2,g								1	19	<25
13 006.5	1.200	2,u								1	19	<25
13 006.5	1.183	0,g^-								2	20	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 007.2	1.172	1,*g*								3	20	<25
13 007.6	1.184	0,u^-								2	20	<25
13 007.7	1.161	2,*u*								4	20	<25
13 007.9	1.184	2,*u*								2	20	<25
13 009.5	1.212	2,*u*								0	20	<25
13 010.1	1.198	1,*g*								1	20	<25
13 010.2	1.183	2,*u*								2	20	<25
13 010.3	1.212	2,*g*								0	20	<25
13 010.4	1.198	1,*u*								1	20	<25
13 010.4	1.171	1,*g*	1	0	2	1	−1	4	2	3	20	29
13 010.6	1.184	2,*g*								2	20	<25
13 011.9	1.166	1,*u*	3	0	0	4	2	1	−1	3	20	46
13 012.6	1.158	2,*g*	1	1	2	0	0	2	2	4	20	47
13 013.2	1.197	1,*u*								1	20	<25
13 013.2	1.183	0,g^+								2	20	<25
13 013.5	1.196	1,*g*								1	20	<25
13 013.6	1.211	2,*u*								0	20	<25
13 013.6	1.202	0,g^+	1	0	0	0	0	14	0	1	19	30
		0,g^+	0	1	0	0	0	16	0	1	19	25
13 014.0	1.159	0,u^-	2	2	0	3	−1	1	1	4	20	53
13 014.7	1.185	0,g^-	1	1	0	6	−6	6	6	2	20	30
13 014.9	1.185	0,g^-								2	20	<25
13 015.0	1.186	0,u^+								2	20	<25
13 015.2	1.185	2,*g*								2	20	<25
13 016.4	1.184	2,*u*								2	20	<25
13 016.8	1.183	0,g^+								2	20	<25
13 016.8	1.160	0,u^-	1	3	0	3	−3	3	3	4	20	37
13 017.8	1.162	2,*g*	0	3	1	3	−1	3	3	4	20	37
13 018.2	1.185	0,u^+								2	20	<25
13 019.0	1.183	0,g^+								2	20	<25
13 019.1	1.184	0,u^-								2	20	<25
13 019.4	1.211	0,g^-	0	0	0	10	−10	10	10	0	20	36
13 019.6	1.211	0,u^-								0	20	<25
13 021.1	1.198	1,*u*								1	20	<25
13 021.1	1.192	1,*u*	0	2	0	0	0	13	1	2	19	60
13 021.2	1.182	2,*g*								2	20	<25
13 021.5	1.162	2,*u*	1	3	0	3	3	3	−1	4	20	34
13 022.1	1.185	2,*g*								2	20	<25
13 022.3	1.198	1,*g*								1	20	<25
13 023.2	1.185	0,u^-								2	20	<25
13 023.5	1.169	1,*g*								3	20	<25
13 023.8	1.162	0,u^+								4	20	<25
13 024.2	1.201	2,*g*	1	0	0	0	0	14	2	1	19	29
13 024.3	1.198	1,*u*								1	20	<25
13 024.4	1.172	1,*u*								3	20	<25
13 024.4	1.211	2,*g*								0	20	<25
13 024.8	1.151	1,*u*	0	4	1	1	1	2	0	5	20	29
		1,*u*	0	4	1	1	−1	2	2	5	20	37
13 024.8	1.186	0,u^+								2	20	<25
13 024.9	1.184	2,*u*								2	20	<25
13 025.1	1.159	2,*u*	2	2	0	3	1	1	1	4	20	47
13 025.6	1.170	1,*g*								3	20	<25
13 025.6	1.185	2,*g*								2	20	<25
13 025.7	1.198	1,*g*								1	20	<25
13 025.7	1.184	0,g^-								2	20	<25
13 027.6	1.174	1,*u*								3	20	<25
13 028.0	1.211	2,*u*								0	20	<25
13 028.0	1.184	2,*u*								2	20	<25
13 029.4	1.170	1,*g*								3	20	<25
13 029.7	1.184	2,*u*								2	20	<25
13 029.8	1.197	1,*u*								1	20	<25
13 029.9	1.155	0,g^+	2	1	1	1	1	1	−1	4	20	42
13 030.7	1.186	2,*u*								2	20	<25
13 030.8	1.196	1,*u*								1	20	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 031.0	1.185	$0,g^+$	1	1	0	6	6	6	−6	2	20	34
13 031.6	1.212	$0,u^-$								0	20	<25
13 031.6	1.212	$0,g^-$								0	20	<25
13 031.9	1.184	$2,g$								2	20	<25
13 032.2	1.201	$0,g^-$								1	19	<25
13 032.7	1.197	$1,g$								1	20	<25
13 032.9	1.201	$0,u^+$								1	19	<25
13 033.0	1.211	$2,g$								0	20	<25
13 033.0	1.182	$0,u^+$								2	20	<25
13 033.1	1.151	$0,u^+$	3	0	1	0	0	0	0	4	20	76
13 033.5	1.169	$1,u$	3	0	0	4	0	1	1	3	20	26
13 033.5	1.212	$0,g^+$	0	0	0	10	10	10	−10	0	20	55
13 033.9	1.140	$0,g^+$	1	5	0	0	0	0	0	6	20	83
13 034.1	1.168	$1,u$	3	0	0	4	0	1	1	3	20	28
13 034.2	1.173	$1,g$								3	20	<25
13 034.3	1.163	$2,u$								4	20	<25
13 034.6	1.184	$2,g$								2	20	<25
13 034.6	1.183	$0,g^-$								2	20	<25
13 037.1	1.211	$0,u^+$								0	20	<25
13 037.7	1.185	$2,u$								2	20	<25
13 038.0	1.197	$1,g$								1	20	<25
13 038.1	1.183	$2,g$								2	20	<25
13 038.1	1.184	$0,u^+$								2	20	<25
13 038.6	1.174	$1,u$								3	20	<25
13 038.8	1.177	$1,u$								3	20	<25
13 039.1	1.172	$1,g$								3	20	<25
13 041.3	1.198	$1,u$								1	20	<25
13 041.5	1.201	$2,g$								1	19	<25
13 041.8	1.201	$2,u$								1	19	<25
13 041.9	1.197	$1,g$								1	20	<25
13 041.9	1.165	$0,u^+$	0	4	0	3	1	5	−1	4	20	33
13 042.2	1.211	$0,g^-$	0	0	0	10	−10	10	10	0	20	36
13 043.1	1.183	$2,u$								2	20	<25
13 043.1	1.186	$2,g$								2	20	<25
13 043.4	1.173	$1,g$								3	20	<25
13 044.0	1.155	$0,g^-$	2	1	1	1	−1	1	1	4	20	58
		$0,g^-$	0	1	3	1	−1	1	1	4	20	33
13 045.2	1.200	$0,u^-$								1	19	<25
13 046.0	1.155	$2,g$	3	1	0	2	2	0	0	4	20	26
		$2,g$	2	1	1	1	1	1	1	4	20	35
13 046.4	1.185	$0,g^+$								2	20	<25
13 047.0	1.198	$1,g$								1	20	<25
13 047.1	1.211	$2,u$								0	20	<25
13 048.4	1.199	$1,u$								1	20	<25
13 049.3	1.152	$1,u$	0	4	1	1	1	2	0	5	20	60
		$1,u$	0	4	1	1	−1	2	2	5	20	34
13 049.5	1.162	$0,u^-$	1	3	0	3	−1	3	1	4	20	59
13 049.6	1.162	$0,u^+$	0	2	2	1	1	3	−1	4	20	29
13 049.8	1.200	$0,g^+$								1	19	<25
13 050.1	1.172	$1,u$								3	20	<25
13 050.6	1.185	$2,u$								2	20	<25
13 050.9	1.164	$2,u$	1	3	0	3	−1	3	3	4	20	28
13 051.0	1.182	$0,g^+$								2	20	<25
13 051.1	1.184	$0,u^+$								2	20	<25
13 051.8	1.197	$1,g$								1	20	<25
13 052.7	1.210	$0,u^-$								0	20	<25
13 052.9	1.168	$1,g$								3	20	<25
13 053.2	1.210	$0,g^+$								0	20	<25
13 053.5	1.198	$1,u$								1	20	<25
13 053.9	1.185	$0,u^-$								2	20	<25
13 054.5	1.213	$1,g$								0	19	<25
13 054.7	1.186	$0,g^+$								2	20	<25
13 054.8	1.197	$1,u$								1	20	<25
13 055.4	1.184	$2,u$								2	20	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 055.6	1.185	2,*g*								2	20	<25
13 055.7	1.186	0,g^-								2	20	<25
13 055.8	1.211	2,*g*								0	20	<25
13 056.7	1.186	0,u^-								2	20	<25
13 056.8	1.143	0,g^+	0	6	0	0	0	2	0	6	20	84
13 057.0	1.200	2,*u*								1	19	<25
13 057.0	1.197	1,*g*								1	20	<25
13 057.1	1.173	1,*u*								3	20	<25
13 057.2	1.149	1,*g*	2	3	0	1	1	0	0	5	20	28
13 057.4	1.186	0,g^-								2	20	<25
13 058.8	1.212	2,*u*								0	20	<25
13 059.2	1.177	1,*g*								3	20	<25
13 059.2	1.214	1,*u*	0	0	0	0	0	19	1	0	19	31
13 059.3	1.198	1,*u*								1	20	<25
13 059.8	1.184	0,u^-								2	20	<25
13 060.4	1.163	2,*u*								4	20	<25
13 060.5	1.210	0,u^+								0	20	<25
13 060.8	1.210	0,g^+								0	20	<25
13 061.4	1.186	2,*g*								2	20	<25
13 061.5	1.183	0,u^+								2	20	<25
13 062.1	1.201	2,*g*								1	19	<25
13 062.1	1.197	1,*u*								1	20	<25
13 062.5	1.160	0,g^+								4	20	<25
13 062.9	1.185	0,g^+								2	20	<25
13 063.3	1.197	1,*g*								1	20	<25
13 063.3	1.211	2,*g*								0	20	<25
13 063.4	1.185	2,*u*								2	20	<25
13 063.9	1.173	1,*g*								3	20	<25
13 064.6	1.184	2,*g*								2	20	<25
13 065.7	1.162	2,*u*								4	20	<25
13 066.9	1.144	2,*g*	0	6	0	0	0	2	2	6	20	100
13 067.5	1.186	2,*g*								2	20	<25
13 067.5	1.198	1,*g*								1	20	<25
13 067.8	1.174	1,*g*								3	20	<25
13 068.4	1.149	1,*u*	0	3	2	0	0	1	1	5	20	64
13 068.8	1.186	0,g^-								2	20	<25
13 069.0	1.185	2,*g*								2	20	<25
13 069.1	1.185	2,*u*								2	20	<25
13 069.2	1.184	0,u^-								2	20	<25
13 069.3	1.198	1,*u*								1	20	<25
13 069.7	1.154	0,g^+	3	1	0	2	0	0	0	4	20	62
13 069.8	1.173	1,*u*								3	20	<25
13 070.2	1.198	1,*g*								1	20	<25
13 071.3	1.184	2,*u*								2	20	<25
13 071.6	1.213	0,u^-								0	20	<25
13 071.6	1.213	0,g^-								0	20	<25
13 072.3	1.183	0,u^+	2	0	0	5	5	5	−5	2	20	39
13 073.0	1.212	2,*g*								0	20	<25
13 073.1	1.155	2,*g*	3	1	0	2	2	0	0	4	20	55
13 073.8	1.186	2,*u*								2	20	<25
13 073.9	1.149	1,*g*	2	3	0	1	1	0	0	5	20	51
13 074.0	1.186	0,u^+								2	20	<25
13 074.2	1.184	0,g^+								2	20	<25
13 074.6	1.212	0,g^+								0	20	<25
13 074.8	1.212	0,u^+								0	20	<25
13 074.9	1.172	1,*u*	2	1	0	4	−2	3	3	3	20	26
13 075.4	1.162	0,u^-	0	2	2	1	−1	3	1	4	20	40
		0,u^-	0	3	1	2	−2	4	2	4	20	29
13 076.0	1.198	1,*g*								1	20	<25
13 076.2	1.212	2,*u*								0	20	<25
13 076.3	1.172	1,*u*								3	20	<25
13 077.0	1.197	1,*u*								1	20	<25
13 077.8	1.184	2,*g*								2	20	<25
13 078.4	1.186	2,*g*								2	20	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 080.8	1.160	2,g								4	20	<25
13 081.2	1.167	1,g								3	20	<25
13 081.3	1.185	2,u								2	20	<25
13 081.5	1.186	0,u^-								2	20	<25
13 081.6	1.175	1,u								3	20	<25
13 082.9	1.211	2,u								0	20	<25
13 083.5	1.184	0,g^+								2	20	<25
13 084.6	1.185	2,g								2	20	<25
13 084.8	1.187	0,u^+								2	20	<25
13 084.9	1.198	1,g								1	20	<25
13 086.3	1.182	0,u^-								2	20	<25
13 086.4	1.185	2,u								2	20	<25
13 086.4	1.172	1,u								3	20	<25
13 086.6	1.172	1,g								3	20	<25
13 087.0	1.200	0,u^-								1	19	<25
13 087.2	1.162	2,u								4	20	<25
13 088.8	1.167	1,g	3	0	0	3	3	2	−2	3	20	28
13 089.4	1.184	2,g								2	20	<25
13 089.4	1.151	1,g	1	3	1	0	0	1	1	5	20	45
		1,g	0	5	0	1	1	4	0	5	20	25
13 089.4	1.198	1,u								1	20	<25
13 089.4	1.186	0,g^-								2	20	<25
13 091.2	1.198	1,g								1	20	<25
13 091.2	1.201	0,g^+								1	19	<25
13 092.5	1.184	0,u^-								2	20	<25
13 092.6	1.211	2,g								0	20	<25
13 092.8	1.198	1,u								1	20	<25
13 093.8	1.183	2,u								2	20	<25
13 095.1	1.185	2,u								2	20	<25
13 095.4	1.167	0,u^-	0	4	0	3	−1	5	1	4	20	68
13 096.1	1.198	1,g								1	20	<25
13 096.8	1.174	1,g								3	20	<25
13 097.8	1.200	2,u								1	19	<25
13 098.4	1.199	1,u								1	20	<25
13 098.5	1.151	1,g	1	4	0	1	1	2	0	5	20	36
13 098.8	1.186	0,g^+								2	20	<25
13 098.9	1.160	0,g^-	2	2	0	2	−2	2	2	4	20	27
		0,g^-	1	2	1	1	−1	3	1	4	20	28
13 099.1	1.186	2,u								2	20	<25
13 099.4	1.211	2,g								0	20	<25
13 100.5	1.162	0,u^+	0	2	2	1	1	3	−1	4	20	38
		0,u^+	0	3	1	2	2	4	−2	4	20	27
13 101.2	1.211	2,u								0	20	<25
13 101.3	1.184	0,u^+								2	20	<25
13 101.3	1.185	0,g^-								2	20	<25
13 101.5	1.163	0,g^+	0	4	0	2	2	6	−2	4	20	26
13 101.7	1.185	2,u								2	20	<25
13 102.3	1.201	2,g								1	19	<25
13 102.4	1.199	1,g								1	20	<25
13 102.8	1.173	1,u								3	20	<25
13 103.0	1.185	0,u^+								2	20	<25
13 103.1	1.198	1,u								1	20	<25
13 103.2	1.186	2,g								2	20	<25
13 103.3	1.183	0,g^-								2	20	<25
13 104.0	1.167	2,u	0	4	0	3	1	5	1	4	20	40
		2,u	0	4	0	3	−1	5	3	4	20	25
13 104.3	1.173	1,u								3	20	<25
13 104.6	1.212	0,u^-								0	20	<25
13 104.9	1.168	1,g	0	0	3	0	0	5	1	3	20	42
13 105.1	1.186	0,g^+								2	20	<25
13 106.1	1.197	1,u								1	20	<25
13 106.7	1.211	0,g^-	0	0	0	8	−8	12	8	0	20	26
13 106.9	1.185	0,u^+								2	20	<25
13 107.1	1.211	2,g								0	20	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 107.2	1.151	1,*g*	1	4	0	1	−1	2	2	5	20	28
13 107.6	1.171	1,*u*	1	0	2	0	0	5	1	3	20	39
13 109.3	1.186	2,*g*								2	20	<25
13 109.6	1.184	2,*g*								2	20	<25
13 109.9	1.185	2,*u*								2	20	<25
13 111.0	1.168	1,*g*	3	0	0	3	−1	2	2	3	20	27
13 111.4	1.198	1,*g*								1	20	<25
13 111.8	1.184	2,*g*								2	20	<25
13 112.1	1.185	0,u^-								2	20	<25
13 112.3	1.212	1,*g*								0	19	<25
13 112.3	1.212	1,*u*								0	19	<25
13 113.3	1.196	1,*g*								1	20	<25
13 113.5	1.160	2,*g*	1	2	1	1	−1	3	3	4	20	27
13 114.1	1.211	2,*u*								0	20	<25
13 114.6	1.198	1,*u*								1	20	<25
13 114.7	1.159	0,g^+	2	2	0	2	2	2	−2	4	20	43
		0,g^+	1	2	1	1	1	3	−1	4	20	34
13 115.0	1.185	2,*u*								2	20	<25
13 115.0	1.162	2,*u*	0	2	2	1	1	3	1	4	20	32
13 115.4	1.172	1,*g*								3	20	<25
13 115.9	1.162	0,u^-	0	2	2	1	−1	3	1	4	20	38
		0,u^-	0	3	1	2	−2	4	2	4	20	49
13 117.0	1.164	2,*g*								4	20	<25
13 117.1	1.198	1,*u*								1	20	<25
13 117.4	1.188	0,g^+								2	20	<25
13 117.5	1.212	0,u^+								0	20	<25
13 117.6	1.175	1,*g*								3	20	<25
13 117.8	1.184	0,g^-	1	0	1	3	−3	7	3	2	20	25
13 118.1	1.184	2,*u*								2	20	<25
13 118.5	1.185	2,*g*								2	20	<25
13 118.8	1.199	1,*g*								1	20	<25
13 120.0	1.212	2,*u*	0	0	0	9	−9	11	11	0	20	48
13 120.9	1.170	1,*u*	2	1	0	4	0	3	1	3	20	34
13 121.4	1.213	0,g^+								0	20	<25
13 121.5	1.185	0,u^-								2	20	<25
13 121.9	1.199	1,*u*								1	20	<25
13 122.8	1.198	1,*g*								1	20	<25
13 124.4	1.159	0,g^-	2	2	0	2	−2	2	2	4	20	54
		0,g^-	1	2	1	1	−1	3	1	4	20	25
13 125.2	1.213	0,u^+								0	20	<25
13 125.7	1.197	1,*g*								1	20	<25
13 126.5	1.185	2,*u*								2	20	<25
13 127.1	1.164	0,u^+	0	3	1	2	2	4	−2	4	20	36
		0,u^+	0	3	1	2	0	4	0	4	20	50
13 127.2	1.198	1,*u*								1	20	<25
13 127.5	1.185	0,g^+								2	20	<25
13 128.0	1.174	1,*g*								3	20	<25
13 128.8	1.211	2,*g*								0	20	<25
13 128.8	1.163	2,*u*	0	3	1	2	2	4	0	4	20	26
13 129.0	1.186	0,u^+	1	1	0	5	5	7	−5	2	20	33
13 129.8	1.174	1,*u*								3	20	<25
13 130.1	1.186	2,*g*								2	20	<25
13 130.3	1.155	1,*g*	0	5	0	1	1	4	0	5	20	45
		1,*g*	0	5	0	1	−1	4	2	5	20	37
13 130.5	1.198	1,*g*								1	20	<25
13 130.6	1.174	1,*u*								3	20	<25
13 131.4	1.166	1,*g*	3	0	0	3	1	2	0	3	20	42
		1,*g*	3	0	0	3	−1	2	2	3	20	27
13 131.6	1.184	0,g^+								2	20	<25
13 132.1	1.185	0,g^-								2	20	<25
13 132.5	1.211	0,g^+								0	20	<25
13 133.1	1.187	2,*g*								2	20	<25
13 133.7	1.186	0,u^-								2	20	<25
13 134.2	1.158	0,g^+	2	2	0	2	0	2	0	4	20	58

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 134.9	1.159	2,*g*	2	2	0	2	2	2	0	4	20	28
		2,*g*	1	2	1	1	1	3	1	4	20	39
13 135.1	1.187	0,u^+								2	20	<25
13 135.4	1.198	1,*u*								1	20	<25
13 135.6	1.184	2,*g*								2	20	<25
13 135.8	1.184	2,*u*								2	20	<25
13 136.4	1.172	1,*u*								3	20	<25
13 138.0	1.211	2,*u*								0	20	<25
13 138.2	1.171	1,*g*								3	20	<25
13 138.4	1.199	1,*g*								1	20	<25
13 138.8	1.168	0,u^+								3	21	<25
13 139.1	1.212	1,*u*								0	19	<25
13 139.1	1.212	1,*g*								0	19	<25
13 139.3	1.168	0,g^+	1	0	2	6	0	0	0	3	21	28
13 139.5	1.186	2,*u*								2	20	<25
13 139.6	1.177	1,*g*								3	20	<25
13 140.0	1.186	2,*g*								2	20	<25
13 140.1	1.211	0,u^-	0	0	0	9	−9	11	9	0	20	27
13 140.7	1.164	0,g^+	1	3	0	2	2	4	−2	4	20	40
13 140.8	1.163	0,g^-	1	2	1	1	−1	3	1	4	20	37
		0,g^-	1	3	0	2	−2	4	2	4	20	25
		0,g^-	0	4	0	2	−2	6	2	4	20	31
13 140.9	1.164	2,*u*	0	3	1	2	0	4	2	4	20	43
		2,*u*	0	3	1	2	−2	4	4	4	20	26
13 142.6	1.186	0,g^+								2	20	<25
13 143.1	1.212	2,*g*								0	20	<25
13 143.9	1.186	2,*u*								2	20	<25
13 143.9	1.187	0,u^+								2	20	<25
13 144.0	1.169	1,*u*								3	20	<25
13 145.4	1.184	0,u^-								2	20	<25
13 145.9	1.186	2,*u*								2	20	<25
13 145.9	1.168	2,*u*								3	21	<25
13 146.2	1.154	0,g^+	0	5	0	6	0	0	0	5	21	94
13 146.4	1.168	2,*g*	1	0	2	6	2	0	0	3	21	30
13 146.6	1.185	2,*g*								2	20	<25
13 146.9	1.159	2,*g*	2	2	0	2	0	2	2	4	20	44
13 149.8	1.154	2,*g*	0	5	0	6	2	0	0	5	21	94
13 150.2	1.213	2,*u*								0	20	<25
13 150.6	1.213	2,*g*								0	20	<25
13 151.1	1.200	1,*u*								1	20	<25
13 151.7	1.212	2,*u*								0	20	<25
13 153.0	1.199	1,*g*								1	20	<25
13 153.0	1.164	2,*g*	1	3	0	2	2	4	0	4	20	34
13 153.7	1.187	0,g^-								2	20	<25
13 153.7	1.187	0,g^+								2	20	<25
13 155.1	1.198	1,*u*								1	20	<25
13 155.5	1.186	2,*g*								2	20	<25
13 155.6	1.186	2,*u*								2	20	<25
13 156.0	1.163	2,*g*	1	3	0	2	−2	4	4	4	20	29
13 156.1	1.187	0,u^+								2	20	<25
13 156.3	1.156	0,u^+	3	1	0	1	1	1	−1	4	20	28
		0,u^+	2	1	1	0	0	2	0	4	20	36
13 156.7	1.197	1,*u*								1	20	<25
13 157.0	1.171	1,*g*	2	1	0	3	−3	4	4	3	20	40
13 157.8	1.186	2,*u*								2	20	<25
13 158.0	1.199	1,*g*								1	20	<25
13 158.2	1.176	1,*u*	0	2	1	3	−3	6	4	3	20	25
13 158.3	1.187	2,*g*								2	20	<25
13 159.6	1.210	0,u^+	0	0	0	17	3	3	−3	0	20	27
13 160.1	1.211	0,g^-	0	0	0	16	−4	4	4	0	20	32
13 160.3	1.211	0,g^+								0	20	<25
13 160.5	1.199	1,*g*								1	20	<25
13 160.8	1.198	1,*u*								1	20	<25
13 161.6	1.163	1,*g*	0	4	0	9	1	0	0	4	21	70

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 161.8	1.177	1,*u*								3	20	<25
13 163.5	1.186	0,u^+	0	0	2	3	1	7	−1	2	20	28
13 163.7	1.182	0,g^+								2	20	<25
13 164.3	1.199	1,*u*								1	20	<25
13 164.3	1.210	2,*u*								0	20	<25
13 164.3	1.212	0,u^-								0	20	<25
13 164.4	1.185	0,u^-								2	20	<25
13 164.6	1.211	0,g^-								0	20	<25
13 164.8	1.186	2,*u*								2	20	<25
13 166.4	1.187	2,*g*								2	20	<25
13 167.1	1.211	2,*g*								0	20	<25
13 167.5	1.174	1,*g*								3	20	<25
13 167.8	1.173	1,*g*								3	20	<25
13 168.2	1.183	0,g^-	2	0	0	4	−4	6	4	2	20	41
13 168.6	1.197	1,*g*								1	20	<25
13 169.1	1.165	0,g^-	1	3	0	2	−2	4	2	4	20	40
		0,g^-	0	4	0	2	−2	6	2	4	20	52
13 169.8	1.211	0,u^+								0	20	<25
13 170.1	1.183	1,*u*								2	21	<25
13 170.1	1.183	1,*g*								2	21	<25
13 170.6	1.176	1,*g*								3	20	<25
13 171.6	1.185	2,*u*								2	20	<25
13 171.7	1.185	0,g^+								2	20	<25
13 172.3	1.182	2,*g*								2	20	<25
13 172.6	1.156	2,*u*	2	1	1	0	0	2	2	4	20	41
13 172.6	1.198	1,*u*								1	20	<25
13 173.9	1.163	0,g^+	1	3	0	2	2	4	−2	4	20	29
		0,g^+	1	3	0	2	0	4	0	4	20	41
13 174.8	1.168	1,*u*								3	20	<25
13 175.2	1.184	0,u^+								2	20	<25
13 175.4	1.187	0,u^-								2	20	<25
13 176.9	1.186	2,*u*								2	20	<25
13 177.2	1.186	0,g^+								2	20	<25
13 178.8	1.186	0,g^-								2	20	<25
13 179.2	1.165	2,*g*	1	3	0	2	−2	4	4	4	20	31
		2,*g*	0	4	0	2	2	6	0	4	20	27
13 179.7	1.199	1,*g*								1	20	<25
13 181.4	1.183	2,*g*	2	0	0	4	−4	6	6	2	20	39
13 182.2	1.197	1,*g*								1	20	<25
13 182.8	1.213	1,*g*								0	19	<25
13 182.9	1.213	1,*u*								0	19	<25
13 183.5	1.212	2,*u*								0	20	<25
13 184.2	1.173	1,*g*								3	20	<25
13 184.3	1.185	2,*g*								2	20	<25
13 184.7	1.184	0,u^+								2	20	<25
13 184.8	1.174	1,*u*								3	20	<25
13 185.0	1.185	0,g^+								2	20	<25
13 185.4	1.199	1,*g*								1	20	<25
13 186.4	1.198	1,*u*								1	20	<25
13 186.6	1.164	2,*g*	1	3	0	2	2	4	0	4	20	27
		2,*g*	1	3	0	2	0	4	2	4	20	36
13 186.7	1.184	2,*u*								2	20	<25
13 186.9	1.211	2,*g*								0	20	<25
13 187.3	1.155	0,u^+	3	1	0	1	1	1	−1	4	20	60
13 187.6	1.164	1,*u*	0	4	0	8	2	1	−1	4	21	34
13 187.6	1.187	0,g^-								2	20	<25
13 187.8	1.187	0,u^-	0	1	1	4	−4	8	4	2	20	28
13 187.9	1.185	2,*u*								2	20	<25
13 187.9	1.154	0,u^-	3	1	0	1	−1	1	1	4	20	88
13 188.2	1.185	2,*g*								2	20	<25
13 188.9	1.198	1,*u*								1	20	<25
13 189.3	1.173	1,*u*								3	20	<25
13 190.9	1.212	2,*g*								0	20	<25
13 192.0	1.210	0,g^+								0	20	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 192.1	1.186	2,g								2	20	<25
13 192.5	1.200	1,u								1	20	<25
13 193.2	1.212	0,u^+								0	20	<25
13 193.3	1.210	0,u^-								0	20	<25
13 194.6	1.202	0,u^-	0	1	0	5	−1	11	1	1	19	26
13 194.7	1.202	0,g^+								1	19	<25
13 195.1	1.185	2,u								2	20	<25
13 195.2	1.163	0,g^+	0	2	2	0	0	4	0	4	20	37
		0,g^+	0	3	1	1	1	5	−1	4	20	38
13 195.3	1.173	1,u								3	20	<25
13 195.4	1.200	1,g								1	20	<25
13 197.5	1.213	0,g^+								0	20	<25
13 197.8	1.173	1,g	1	1	1	2	0	5	1	3	20	34
13 197.8	1.186	2,g								2	20	<25
13 198.7	1.169	1,u								3	20	<25
13 199.0	1.200	1,g								1	20	<25
13 200.6	1.186	0,u^-								2	20	<25
13 200.9	1.186	2,u								2	20	<25
13 201.4	1.213	2,u								0	20	<25
13 202.4	1.153	1,g	0	4	1	0	0	3	1	5	20	95
13 202.4	1.186	2,g								2	20	<25
13 203.6	1.212	2,g								0	20	<25
13 203.6	1.202	2,u								1	19	<25
13 203.7	1.202	2,g								1	19	<25
13 203.7	1.172	0,u^+								3	21	<25
13 203.9	1.198	1,u								1	20	<25
13 204.1	1.186	0,g^-	1	1	0	4	−4	8	4	2	20	25
13 204.3	1.176	1,g								3	20	<25
13 204.5	1.172	0,g^+								3	21	<25
13 205.0	1.154	2,u	3	1	0	1	1	1	1	4	20	65
13 209.0	1.172	2,u								3	21	<25
13 209.1	1.166	1,u	3	0	0	2	2	3	−1	3	20	32
		1,u	3	0	0	2	−2	3	3	3	20	28
13 209.6	1.163	2,g	0	2	2	0	0	4	2	4	20	39
13 209.7	1.185	0,g^+								2	20	<25
13 209.8	1.172	2,g								3	21	<25
13 210.4	1.186	0,u^+								2	20	<25
13 210.5	1.199	1,u								1	20	<25
13 210.6	1.210	2,g								0	20	<25
13 210.8	1.186	2,u								2	20	<25
13 211.8	1.161	0,u^+	1	3	0	1	1	5	−1	4	20	30
13 211.9	1.210	2,u								0	20	<25
13 212.0	1.214	0,u^-								0	20	<25
13 212.3	1.214	0,g^-								0	20	<25
13 213.5	1.210	0,g^+								0	20	<25
13 214.1	1.187	2,g								2	20	<25
13 215.5	1.212	0,g^-								0	20	<25
13 216.3	1.198	1,g								1	20	<25
13 216.4	1.186	2,u								2	20	<25
13 217.7	1.186	0,g^+								2	20	<25
13 219.2	1.167	0,g^+	0	4	0	2	2	6	−2	4	20	38
		0,g^+	0	4	0	2	0	6	0	4	20	43
13 219.5	1.170	1,g	2	1	0	3	1	4	0	3	20	34
13 220.5	1.148	1,u	2	3	0	0	0	1	1	5	20	71
13 220.9	1.185	2,g								2	20	<25
13 220.9	1.187	0,g^-	0	0	2	2	−2	8	2	2	20	30
13 222.5	1.212	2,u								0	20	<25
13 222.8	1.187	0,u^-								2	20	<25
13 223.0	1.198	1,g								1	20	<25
13 223.8	1.175	1,g								3	20	<25
13 224.0	1.186	2,g								2	20	<25
13 224.2	1.200	1,u								1	20	<25
13 225.6	1.199	1,g								1	20	<25
13 225.6	1.188	0,u^+								2	20	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 226.4	1.212	2,*g*								0	20	<25
13 227.0	1.161	2,*u*								4	20	<25
13 227.6	1.149	0,g^+	4	0	0	0	0	0	0	4	20	89
13 228.0	1.176	1,*u*								3	20	<25
13 228.7	1.154	0,u^+	0	5	0	5	1	1	−1	5	21	88
13 228.9	1.167	2,*g*	0	4	0	2	2	6	0	4	20	27
		2,*g*	0	4	0	2	0	6	2	4	20	42
13 229.2	1.155	1,*g*	2	0	2	1	1	0	0	4	21	42
		1,*g*	0	0	4	1	1	0	0	4	21	25
13 229.2	1.187	0,u^+								2	20	<25
13 230.9	1.154	2,*u*	0	5	0	5	3	1	−1	5	21	68
13 231.3	1.166	1,*u*	3	0	0	2	0	3	1	3	20	54
13 231.8	1.198	1,*g*								1	20	<25
13 232.0	1.188	0,g^-								2	20	<25
13 232.6	1.153	1,*u*	1	0	3	1	1	0	0	4	21	65
13 232.6	1.185	0,u^+	2	0	0	3	1	7	−1	2	20	26
13 232.7	1.169	0,u^+								3	21	<25
13 232.8	1.169	0,g^+	1	0	2	6	0	0	0	3	21	25
13 234.0	1.198	1,*u*								1	20	<25
13 234.1	1.200	1,*g*								1	20	<25
13 234.3	1.174	1,*g*	0	1	2	1	−1	6	2	3	20	28
13 234.3	1.188	0,g^+								2	20	<25
13 234.4	1.187	2,*u*								2	20	<25
13 234.7	1.188	0,u^-								2	20	<25
13 234.8	1.212	2,*u*								0	20	<25
13 235.7	1.163	0,g^+	0	2	2	0	0	4	0	4	20	44
		0,g^+	0	3	1	1	1	5	−1	4	20	44
13 236.0	1.215	0,u^+								0	20	<25
13 236.3	1.187	2,*g*								2	20	<25
13 236.7	1.211	0,u^-								0	20	<25
13 237.2	1.162	1,*g*								4	21	<25
13 238.2	1.188	2,*u*								2	20	<25
13 239.4	1.169	2,*g*								3	21	<25
13 239.5	1.184	0,u^-								2	20	<25
13 239.7	1.169	2,*u*								3	21	<25
13 239.9	1.179	1,*u*								3	20	<25
13 240.5	1.198	1,*u*								1	20	<25
13 241.3	1.188	2,*u*								2	20	<25
13 241.7	1.215	0,g^+								0	20	<25
13 242.1	1.198	0,u^+								1	21	<25
13 242.1	1.198	0,g^+								1	21	<25
13 242.8	1.200	1,*u*								1	20	<25
13 243.0	1.188	2,*g*								2	20	<25
13 243.5	1.176	1,*g*								3	20	<25
13 243.9	1.213	2,*g*								0	20	<25
13 245.4	1.169	0,g^-								3	21	<25
13 245.9	1.187	2,*u*								2	20	<25
13 246.0	1.186	0,g^+								2	20	<25
13 246.2	1.211	2,*u*								0	20	<25
13 246.2	1.169	0,u^-	1	0	2	5	−1	1	1	3	21	31
13 246.7	1.184	0,u^-								2	20	<25
13 246.9	1.177	1,*u*								3	20	<25
13 247.2	1.199	1,*u*								1	20	<25
13 247.5	1.186	2,*u*								2	20	<25
13 247.8	1.144	1,*g*	0	6	0	3	1	0	0	6	21	99
13 248.3	1.185	0,g^-								2	20	<25
13 248.8	1.165	1,*u*	0	4	0	8	2	1	−1	4	21	37
		1,*u*	0	4	0	8	0	1	1	4	21	38
13 249.1	1.163	2,*g*	0	2	2	0	0	4	2	4	20	39
		2,*g*	0	3	1	1	1	5	1	4	20	39
13 249.1	1.165	0,g^-	0	3	1	1	−1	5	1	4	20	90
13 249.5	1.199	1,*g*								1	20	<25
13 249.6	1.152	1,*u*	1	4	0	0	0	3	1	5	20	53
		1,*u*	0	5	0	0	0	5	1	5	20	28

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 249.7	1.187	2,g								2	20	<25
13 249.8	1.201	1,u								1	20	<25
13 250.1	1.162	0,u^+	2	2	0	1	1	3	−1	4	20	50
		0,u^+	0	4	0	1	1	7	−1	4	20	25
13 251.3	1.187	0,g^+								2	20	<25
13 252.2	1.183	2,u								2	20	<25
13 252.8	1.169	2,g								3	21	<25
13 252.8	1.186	2,g								2	20	<25
13 252.8	1.183	1,u								2	21	<25
13 252.9	1.183	1,g								2	21	<25
13 253.2	1.210	0,u^+								0	20	<25
13 253.3	1.198	2,g								1	21	<25
13 253.3	1.198	2,u								1	21	<25
13 253.5	1.169	2,u								3	21	<25
13 253.6	1.199	1,g								1	20	<25
13 254.5	1.160	0,u^-	2	2	0	1	−1	3	1	4	20	71
13 254.7	1.172	1,u								3	20	<25
13 255.0	1.186	0,u^+								2	20	<25
13 256.0	1.212	0,u^+								0	20	<25
13 256.1	1.184	2,u								2	20	<25
13 256.2	1.200	1,u								1	20	<25
13 256.4	1.173	1,u								3	20	<25
13 258.5	1.162	0,u^+	1	2	1	0	0	4	0	4	20	66
13 259.0	1.183	1,g								2	21	<25
13 259.1	1.183	1,u								2	21	<25
13 259.9	1.178	1,g								3	20	<25
13 260.8	1.185	2,g								2	20	<25
13 260.9	1.199	1,g								1	20	<25
13 261.8	1.185	0,g^-								2	20	<25
13 263.0	1.169	1,g	2	0	1	0	0	5	1	3	20	40
13 263.2	1.172	0,g^+	0	3	0	12	0	0	0	3	21	29
13 263.5	1.161	1,u	0	3	1	7	1	0	0	4	21	28
13 263.5	1.165	2,g	0	3	1	1	1	5	1	4	20	29
		2,g	0	3	1	1	−1	5	3	4	20	54
13 263.5	1.161	2,u	2	2	0	1	−1	3	3	4	20	55
13 265.2	1.187	2,g								2	20	<25
13 265.2	1.186	2,u								2	20	<25
13 265.5	1.213	2,g								0	20	<25
13 266.8	1.172	2,g	0	3	0	12	2	0	0	3	21	28
13 267.4	1.161	2,u	2	2	0	1	1	3	1	4	20	40
13 268.1	1.214	2,u								0	20	<25
13 268.4	1.155	0,u^-	0	5	0	5	−1	1	1	5	21	95
13 269.8	1.211	2,g								0	20	<25
13 271.4	1.184	2,g								2	20	<25
13 271.7	1.200	1,g								1	20	<25
13 271.7	1.186	0,g^+	1	1	0	4	4	8	−4	2	20	28
13 273.0	1.162	2,u	1	2	1	0	0	4	2	4	20	57
13 273.2	1.211	2,u								0	20	<25
13 273.6	1.172	0,u^+								3	21	<25
13 273.8	1.155	2,u	0	5	0	5	3	1	−1	5	21	25
		2,u	0	5	0	5	1	1	1	5	21	69
13 273.9	1.211	0,g^-	0	0	0	18	−2	2	2	0	20	30
13 275.5	1.160	1,g								4	21	<25
13 276.9	1.172	2,u								3	21	<25
13 277.1	1.186	0,u^+								2	20	<25
13 278.7	1.200	1,u								1	20	<25
13 278.8	1.213	2,g								0	20	<25
13 279.4	1.201	1,g								1	20	<25
13 281.6	1.175	1,g								3	20	<25
13 282.3	1.185	0,u^-	2	0	0	3	−3	7	3	2	20	33
13 282.9	1.172	0,u^+	0	3	0	11	1	1	−1	3	21	31
13 283.2	1.200	1,u								1	20	<25
13 283.5	1.212	0,g^+								0	20	<25
13 283.6	1.172	0,g^+								3	21	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 284.3	1.187	2,*g*								2	20	<25
13 284.8	1.213	0,u^-								0	20	<25
13 285.3	1.176	1,*g*								3	20	<25
13 285.7	1.172	2,*u*	0	3	0	11	3	1	−1	3	21	27
13 285.8	1.172	2,*g*								3	21	<25
13 287.0	1.165	1,*g*	0	4	0	7	3	2	−2	4	21	25
		1,*g*	0	4	0	7	−1	2	2	4	21	38
13 287.3	1.187	0,g^-	0	1	1	3	−1	9	1	2	20	27
13 287.3	1.173	0,u^-								3	21	<25
13 287.4	1.185	1,*g*								2	21	<25
13 287.4	1.185	1,*u*								2	21	<25
13 287.6	1.173	0,g^-								3	21	<25
13 287.7	1.155	1,*u*	1	4	0	0	0	3	1	5	20	29
		1,*u*	0	5	0	0	0	5	1	5	20	70
13 287.7	1.189	0,u^+								2	20	<25
13 288.3	1.187	0,g^+								2	20	<25
13 288.9	1.200	1,*g*								1	20	<25
13 289.8	1.199	1,*u*								1	20	<25
13 290.0	1.172	1,*u*	2	1	0	2	−2	5	3	3	20	28
13 290.0	1.186	2,*u*								2	20	<25
13 291.6	1.188	0,u^+								2	20	<25
13 292.0	1.187	0,u^-								2	20	<25
13 293.6	1.160	1,*u*	0	3	1	7	1	0	0	4	21	32
13 293.7	1.166	0,u^+	1	3	0	1	1	5	−1	4	20	48
		0,u^+	0	4	0	1	1	7	−1	4	20	42
13 293.9	1.213	2,*u*								0	20	<25
13 294.0	1.173	2,*u*								3	21	<25
13 294.7	1.187	2,*g*								2	20	<25
13 295.0	1.173	2,*g*								3	21	<25
13 295.1	1.185	2,*u*								2	20	<25
13 296.7	1.199	1,*u*								1	20	<25
13 296.8	1.177	1,*u*								3	20	<25
13 297.0	1.164	0,u^-	1	3	0	1	−1	5	1	4	20	62
13 297.2	1.188	2,*u*								2	20	<25
13 297.3	1.213	0,g^-								0	20	<25
13 297.3	1.188	0,g^+								2	20	<25
13 297.6	1.188	0,g^-	0	1	1	3	−3	9	3	2	20	33
13 300.1	1.212	1,*g*								0	19	<25
13 300.1	1.212	1,*u*								0	19	<25
13 300.9	1.187	2,*g*								2	20	<25
13 300.9	1.199	1,*g*								1	20	<25
13 301.8	1.211	2,*g*								0	20	<25
13 302.8	1.210	0,g^+								0	20	<25
13 302.9	1.189	2,*u*								2	20	<25
13 305.2	1.212	0,g^+								0	20	<25
13 305.6	1.200	1,*g*								1	20	<25
13 306.7	1.165	2,*u*	1	3	0	1	−1	5	3	4	20	42
13 308.7	1.187	2,*u*								2	20	<25
13 308.7	1.187	2,*g*								2	20	<25
13 308.9	1.198	1,*g*								1	20	<25
13 309.5	1.164	2,*u*	1	3	0	1	1	5	1	4	20	44
13 310.2	1.173	0,g^+								3	21	<25
13 311.1	1.167	1,*g*	3	0	0	1	1	4	0	3	20	26
		1,*g*	3	0	0	1	−1	4	2	3	20	37
13 312.0	1.163	1,*u*								4	21	<25
13 312.1	1.176	1,*u*								3	20	<25
13 312.3	1.188	2,*g*								2	20	<25
13 313.1	1.200	1,*u*								1	20	<25
13 314.0	1.173	2,*g*								3	21	<25
13 314.1	1.155	0,g^+	3	1	0	0	0	2	0	4	20	85
13 314.3	1.198	0,u^-								1	21	<25
13 314.3	1.198	0,g^-								1	21	<25
13 315.9	1.210	0,u^-	0	0	0	19	−1	1	1	0	20	31
13 316.6	1.188	0,u^-	1	1	0	3	−3	9	3	2	20	30

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 316.6	1.187	$0,g^+$								2	20	<25
13 317.1	1.171	$1,u$	2	1	0	2	0	5	1	3	20	41
13 317.1	1.185	$0,u^+$								2	20	<25
13 317.2	1.200	$1,u$								1	20	<25
13 317.7	1.211	$2,u$	0	0	0	19	1	1	1	0	20	28
13 317.9	1.210	$2,g$								0	20	<25
13 318.8	1.201	$1,g$								1	20	<25
13 320.1	1.171	$0,u^+$								3	21	<25
13 321.3	1.159	$1,g$	1	1	2	3	1	0	0	4	21	35
		$1,g$	1	3	0	7	1	0	0	4	21	26
13 322.2	1.198	$2,u$								1	21	<25
13 322.2	1.198	$2,g$								1	21	<25
13 322.5	1.173	$2,u$								3	21	<25
13 322.6	1.174	$0,u^-$								3	21	<25
13 323.4	1.213	$2,u$								0	20	<25
13 324.2	1.175	$1,u$	0	1	2	0	0	7	1	3	20	52
13 324.4	1.176	$1,g$	0	2	1	2	0	7	1	3	20	26
13 324.7	1.185	$0,g^+$								2	20	<25
13 325.4	1.186	$2,u$								2	20	<25
13 326.0	1.214	$0,u^+$								0	20	<25
13 327.1	1.188	$2,g$								2	20	<25
13 327.4	1.213	$2,g$								0	20	<25
13 327.4	1.187	$0,g^-$								2	20	<25
13 327.6	1.214	$1,u$								0	21	<25
13 327.6	1.214	$1,g$								0	21	<25
13 328.4	1.155	$2,g$	3	1	0	0	0	2	2	4	20	87
13 328.5	1.186	$0,u^-$								2	20	<25
13 329.6	1.172	$2,u$								3	21	<25
13 329.8	1.169	$0,g^+$								3	21	<25
13 330.0	1.155	$0,g^+$	0	5	0	4	2	2	−2	5	21	48
		$0,g^+$	0	5	0	4	0	2	0	5	21	33
13 330.1	1.201	$1,u$								1	20	<25
13 330.2	1.167	$1,g$	3	0	0	1	1	4	0	3	20	46
		$1,g$	3	0	0	1	−1	4	2	3	20	38
13 330.8	1.155	$2,g$	0	5	0	4	4	2	−2	5	21	61
13 331.1	1.187	$2,u$								2	20	<25
13 331.5	1.183	$1,g$								2	21	<25
13 331.5	1.152	$0,u^+$	0	4	1	4	0	0	0	5	21	87
13 332.5	1.212	$2,u$								0	20	<25
13 332.5	1.183	$1,u$								2	21	<25
13 333.0	1.184	$2,g$								2	20	<25
13 333.8	1.201	$1,u$								1	20	<25
13 333.9	1.211	$0,u^+$								0	20	<25
13 334.2	1.212	$1,g$								0	19	<25
13 334.2	1.212	$1,u$								0	19	<25
13 334.3	1.183	$1,u$								2	21	<25
13 334.5	1.187	$0,u^+$								2	20	<25
13 334.6	1.171	$0,u^+$								3	21	<25
13 335.0	1.183	$1,g$								2	21	<25
13 335.1	1.152	$2,u$	0	4	1	4	2	0	0	5	21	89
13 335.6	1.215	$2,g$								0	20	<25
13 335.7	1.175	$1,g$								3	20	<25
13 336.5	1.169	$2,g$								3	21	<25
13 336.8	1.171	$0,g^-$								3	21	<25
13 337.1	1.186	$2,u$								2	20	<25
13 338.0	1.213	$0,u^-$	0	0	0	5	−5	15	5	0	20	27
13 338.8	1.187	$2,g$								2	20	<25
13 339.0	1.170	$2,u$								3	21	<25
13 339.3	1.201	$1,u$								1	20	<25
13 339.4	1.179	$1,g$								3	20	<25
13 339.4	1.187	$0,u^+$								2	20	<25
13 341.7	1.199	$1,g$								1	20	<25
13 341.8	1.172	$2,g$								3	21	<25
13 341.8	1.185	$0,g^+$	2	0	0	2	0	8	0	2	20	30

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 342.8	1.168	$0,u^-$	0	4	0	1	−1	7	1	4	20	76
13 342.9	1.165	$1,u$	0	4	0	6	4	3	−3	4	21	30
13 343.4	1.184	$1,g$								2	21	<25
13 343.8	1.184	$1,u$								2	21	<25
13 343.9	1.170	$0,u^-$								3	21	<25
13 346.0	1.185	$2,u$								2	20	<25
13 346.3	1.199	$1,u$								1	20	<25
13 346.4	1.163	$1,g$								4	21	<25
13 347.1	1.172	$0,g^+$								3	21	<25
13 347.5	1.198	$0,u^+$								1	21	<25
13 347.5	1.198	$0,g^+$								1	21	<25
13 348.0	1.170	$2,u$								3	21	<25
13 348.6	1.171	$2,g$								3	21	<25
13 349.8	1.189	$0,g^+$								2	20	<25
13 349.9	1.187	$0,u^-$	0	0	2	1	−1	9	1	2	20	34
13 350.8	1.164	$1,g$	0	4	0	7	1	2	0	4	21	30
13 352.0	1.213	$2,u$								0	20	<25
13 352.1	1.200	$1,g$								1	20	<25
13 352.4	1.189	$2,u$								2	20	<25
13 352.9	1.214	$0,g^-$								0	20	<25
13 353.0	1.186	$1,u$								2	21	<25
13 353.0	1.186	$1,g$								2	21	<25
13 353.8	1.168	$2,u$	0	4	0	1	1	7	1	4	20	44
		$2,u$	0	4	0	1	−1	7	3	4	20	32
13 353.8	1.171	$0,u^+$								3	21	<25
13 354.2	1.172	$0,g^+$								3	21	<25
13 354.3	1.179	$1,u$	0	3	0	2	2	9	−1	3	20	29
		$1,u$	0	3	0	2	−2	9	3	3	20	27
13 354.6	1.200	$1,g$								1	20	<25
13 354.8	1.214	$0,g^+$								0	20	<25
13 355.0	1.214	$0,u^-$								0	20	<25
13 355.9	1.185	$2,g$	2	0	0	2	0	8	2	2	20	29
13 356.3	1.173	$0,g^-$	1	1	1	7	−1	1	1	3	21	26
		$0,g^-$	0	3	0	10	−2	2	2	3	21	28
13 357.5	1.161	$1,u$								4	21	<25
13 358.2	1.198	$2,u$								1	21	<25
13 358.2	1.198	$2,g$								1	21	<25
13 359.1	1.173	$2,g$								3	21	<25
13 359.7	1.155	$0,g^-$	0	5	0	4	−2	2	2	5	21	91
13 359.9	1.189	$0,g^+$								2	20	<25
13 360.3	1.215	$0,u^+$								0	20	<25
13 360.9	1.184	$1,u$								2	21	<25
13 361.7	1.189	$2,g$								2	20	<25
13 362.0	1.171	$2,u$								3	21	<25
13 362.3	1.184	$1,g$								2	21	<25
13 362.3	1.213	$2,u$								0	20	<25
13 362.5	1.170	$0,u^+$	0	2	1	10	0	0	0	3	21	27
13 362.6	1.172	$0,g^-$								3	21	<25
13 362.9	1.188	$2,u$								2	20	<25
13 363.0	1.155	$2,g$	0	5	0	4	4	2	−2	5	21	28
		$2,g$	0	5	0	4	0	2	2	5	21	33
13 363.3	1.172	$2,g$								3	21	<25
13 363.5	1.188	$0,g^-$								2	20	<25
13 363.7	1.202	$1,g$								1	20	<25
13 363.8	1.172	$0,u^-$								3	21	<25
13 365.0	1.160	$1,g$	0	2	2	5	1	0	0	4	21	36
13 365.4	1.187	$0,u^+$								2	20	<25
13 365.6	1.199	$1,g$								1	20	<25
13 365.8	1.170	$2,u$	0	2	1	10	2	0	0	3	21	31
13 366.0	1.177	$1,u$	0	2	1	1	1	8	0	3	20	32
		$1,u$	0	2	1	1	−1	8	2	3	20	26
13 366.2	1.189	$0,u^-$	0	0	2	1	−1	9	1	2	20	27
13 366.6	1.172	$2,u$								3	21	<25
13 367.1	1.172	$0,u^+$								3	21	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 367.9	1.172	2,*g*								3	21	<25
13 367.9	1.166	0,u^+	0	3	1	0	0	6	0	4	20	91
13 368.4	1.199	1,*u*								1	20	<25
13 368.5	1.160	1,*g*								4	21	<25
13 369.5	1.154	1,*u*	2	0	2	0	0	1	1	4	21	51
		1,*u*	0	0	4	0	0	1	1	4	21	34
13 370.5	1.212	2,*g*								0	20	<25
13 371.1	1.171	0,g^+								3	21	<25
13 371.2	1.189	2,*g*								2	20	<25
13 371.5	1.173	2,*u*								3	21	<25
13 372.9	1.161	0,g^+	2	2	0	0	0	4	0	4	20	55
		0,g^+	1	3	0	0	0	6	0	4	20	27
13 374.1	1.188	2,*u*								2	20	<25
13 374.1	1.156	1,*g*	1	0	3	0	0	1	1	4	21	52
13 375.6	1.199	1,*u*								1	20	<25
13 376.4	1.172	2,*g*								3	21	<25
13 376.7	1.151	0,g^+	1	4	0	4	0	0	0	5	21	77
13 376.8	1.200	1,*g*								1	20	<25
13 377.4	1.176	1,*u*	1	2	0	2	0	7	1	3	20	37
13 378.0	1.188	2,*g*								2	20	<25
13 378.3	1.173	0,g^+	0	2	1	9	1	1	−1	3	21	43
13 379.6	1.173	2,*g*	0	2	1	9	3	1	−1	3	21	26
13 379.8	1.212	0,g^-								0	20	<25
13 380.1	1.188	2,*u*								2	20	<25
13 380.3	1.173	0,u^+								3	21	<25
13 381.6	1.187	0,g^-								2	20	<25
13 381.7	1.151	2,*g*	1	4	0	4	2	0	0	5	21	75
13 382.2	1.166	2,*u*	0	3	1	0	0	6	2	4	20	89
13 382.9	1.160	1,*u*	1	2	1	5	1	0	0	4	21	35
13 383.5	1.173	1,*g*	1	1	1	0	0	7	1	3	20	48
13 383.5	1.214	0,g^+								0	20	<25
13 383.5	1.172	0,g^+								3	21	<25
13 383.7	1.200	1,*g*								1	20	<25
13 385.1	1.201	1,*u*								1	20	<25
13 385.6	1.163	1,*g*								4	21	<25
13 386.0	1.209	0,g^+	0	0	0	20	0	0	0	0	20	38
13 386.6	1.212	2,*g*								0	20	<25
13 386.7	1.199	0,u^+								1	21	<25
13 386.7	1.199	0,g^+								1	21	<25
13 387.1	1.173	2,*u*								3	21	<25
13 387.3	1.161	2,*g*	2	2	0	0	0	4	2	4	20	58
		2,*g*	1	3	0	0	0	6	2	4	20	25
13 387.8	1.172	0,u^+								3	21	<25
13 388.4	1.172	2,*g*								3	21	<25
13 388.8	1.177	1,*g*								3	20	<25
13 390.0	1.173	2,*u*								3	21	<25
13 390.9	1.188	0,u^+								2	20	<25
13 391.0	1.163	1,*u*								4	21	<25
13 391.2	1.183	1,*g*								2	21	<25
13 391.6	1.144	1,*u*	0	6	0	2	2	1	−1	6	21	73
13 393.2	1.187	2,*g*								2	20	<25
13 393.9	1.183	1,*u*								2	21	<25
13 394.2	1.213	2,*u*								0	20	<25
13 395.0	1.172	2,*g*								3	21	<25
13 395.8	1.186	0,u^-								2	20	<25
13 395.9	1.165	1,*u*	0	4	0	6	−2	3	3	4	21	37
13 396.0	1.172	0,g^+								3	21	<25
13 396.1	1.201	1,*g*								1	20	<25
13 396.3	1.183	1,*g*								2	21	<25
13 396.4	1.213	2,*g*								0	20	<25
13 396.4	1.199	2,*g*								1	21	<25
13 396.4	1.199	2,*u*								1	21	<25
13 398.5	1.214	1,*g*								0	21	<25
13 398.5	1.214	1,*u*								0	21	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 399.0	1.201	1,u								1	20	<25
13 399.3	1.188	0,g^+	0	0	2	0	0	10	0	2	20	35
13 399.9	1.174	0,u^-								3	21	<25
13 400.5	1.156	0,g^+	0	5	0	4	2	2	−2	5	21	36
		0,g^+	0	5	0	4	0	2	0	5	21	58
13 400.7	1.184	1,u								2	21	<25
13 401.1	1.200	0,u^+								1	21	<25
13 401.1	1.200	0,g^+								1	21	<25
13 401.3	1.183	1,g								2	21	<25
13 401.9	1.188	2,u								2	20	<25
13 402.3	1.174	2,u								3	21	<25
13 402.9	1.187	0,u^-								2	20	<25
13 403.8	1.174	0,g^-								3	21	<25
13 404.2	1.200	1,u								1	20	<25
13 404.4	1.173	0,u^+								3	21	<25
13 405.2	1.212	2,g								0	20	<25
13 405.4	1.161	1,u	1	3	0	6	2	1	−1	4	21	36
13 405.5	1.201	1,g								1	20	<25
13 406.2	1.185	0,g^-	2	0	0	2	−2	8	2	2	20	41
		0,g^-	1	0	1	1	−1	9	1	2	20	27
13 406.4	1.173	2,u								3	21	<25
13 407.1	1.187	0,g^+								2	20	<25
13 407.3	1.156	2,g	0	5	0	4	2	2	0	5	21	46
		2,g	0	5	0	4	0	2	2	5	21	45
13 407.5	1.186	2,u								2	20	<25
13 408.2	1.213	0,g^-								0	20	<25
13 408.3	1.185	1,u								2	21	<25
13 408.6	1.189	0,g^+								2	20	<25
13 409.0	1.162	1,g								4	21	<25
13 409.6	1.198	0,u^-								1	21	<25
13 409.6	1.198	0,g^-								1	21	<25
13 409.8	1.172	1,g	2	1	0	1	1	6	0	3	20	37
		1,g	2	1	0	1	−1	6	2	3	20	33
13 409.8	1.173	2,g								3	21	<25
13 410.0	1.175	0,g^+								3	21	<25
13 410.3	1.214	0,u^+								0	20	<25
13 410.4	1.214	2,u								0	20	<25
13 410.4	1.186	2,g	0	0	2	0	0	10	2	2	20	31
13 410.7	1.185	1,u								2	21	<25
13 411.1	1.161	1,g								4	21	<25
13 411.3	1.200	2,g								1	21	<25
13 411.3	1.200	2,u								1	21	<25
13 412.7	1.185	1,g								2	21	<25
13 413.2	1.187	2,u								2	20	<25
13 413.4	1.201	1,u								1	20	<25
13 413.8	1.144	1,u	0	6	0	2	2	1	−1	6	21	25
		1,u	0	6	0	2	0	1	1	6	21	74
13 414.0	1.187	0,u^+	1	0	1	0	0	10	0	2	20	35
13 415.1	1.198	2,u								1	21	<25
13 415.1	1.198	2,g								1	21	<25
13 415.7	1.165	0,g^+	2	2	0	0	0	4	0	4	20	26
		0,g^+	1	3	0	0	0	6	0	4	20	38
		0,g^+	0	4	0	0	0	8	0	4	20	31
13 416.0	1.187	2,g								2	20	<25
13 416.3	1.178	1,u	0	2	1	1	1	8	0	3	20	38
		1,u	0	2	1	1	−1	8	2	3	20	40
13 417.4	1.175	2,g								3	21	<25
13 417.6	1.214	2,g								0	20	<25
13 417.7	1.185	1,u								2	21	<25
13 418.2	1.184	1,g								2	21	<25
13 418.3	1.171	0,u^+								3	21	<25
13 418.4	1.172	0,g^+								3	21	<25
13 418.7	1.171	2,u								3	21	<25
13 419.0	1.188	2,g								2	20	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 419.5	1.186	1,*g*								2	21	<25
13 420.0	1.189	0,u^-	0	1	1	2	−2	10	2	2	20	47
13 420.6	1.173	2,*u*								3	21	<25
13 421.2	1.185	1,*u*								2	21	<25
13 424.0	1.158	1,*u*	1	1	2	2	2	1	−1	4	21	35
13 424.3	1.171	0,u^+								3	21	<25
13 424.4	1.173	0,u^-	0	1	2	7	−1	1	1	3	21	27
13 424.7	1.168	1,*u*	3	0	0	0	0	5	1	3	20	83
13 425.0	1.184	1,*g*								2	21	<25
13 425.7	1.187	2,*g*								2	20	<25
13 425.8	1.187	2,*u*	1	0	1	0	0	10	2	2	20	27
13 426.6	1.185	1,*u*								2	21	<25
13 427.0	1.162	1,*g*								4	21	<25
13 427.8	1.171	0,g^+								3	21	<25
13 428.8	1.211	0,u^-	0	0	0	19	−1	1	1	0	20	29
13 429.0	1.165	2,*g*	1	3	0	0	0	6	2	4	20	41
		2,*g*	0	4	0	0	0	8	2	4	20	30
13 429.0	1.172	2,*g*								3	21	<25
13 429.1	1.212	2,*u*								0	20	<25
13 430.7	1.201	1,*u*								1	20	<25
13 431.3	1.160	1,*u*	1	3	0	6	0	1	1	4	21	31
13 431.6	1.172	2,*g*								3	21	<25
13 432.1	1.171	2,*u*								3	21	<25
13 432.4	1.171	0,u^+								3	21	<25
13 432.6	1.185	1,*u*								2	21	<25
13 432.9	1.200	1,*g*								1	20	<25
13 433.0	1.213	0,u^+								0	20	<25
13 433.0	1.151	0,g^+	0	3	2	2	0	0	0	5	21	31
		0,g^+	0	4	1	3	1	1	−1	5	21	47
13 433.5	1.180	1,*u*	0	3	0	2	0	9	1	3	20	33
13 433.5	1.160	1,*g*								4	21	<25
13 433.8	1.189	2,*u*								2	20	<25
13 434.2	1.171	0,g^-								3	21	<25
13 434.8	1.184	1,*g*								2	21	<25
13 434.9	1.151	2,*g*	0	3	2	2	2	0	0	5	21	29
		2,*g*	0	4	1	3	3	1	−1	5	21	47
13 434.9	1.184	1,*u*								2	21	<25
13 435.3	1.185	1,*g*								2	21	<25
13 435.4	1.188	0,g^-								2	20	<25
13 435.6	1.200	1,*u*								1	20	<25
13 435.8	1.171	2,*g*								3	21	<25
13 436.9	1.171	0,g^+								3	21	<25
13 438.1	1.214	0,u^-								0	20	<25
13 438.2	1.173	0,u^-	1	2	0	9	−1	1	1	3	21	31
13 439.4	1.174	0,u^+								3	21	<25
13 439.6	1.171	0,g^-								3	21	<25
13 440.3	1.191	0,u^+	0	2	0	1	1	13	−1	2	20	26
13 440.4	1.179	1,*g*								3	20	<25
13 441.3	1.173	2,*u*								3	21	<25
13 441.3	1.197	0,u^+								1	21	<25
13 441.3	1.197	0,g^+								1	21	<25
13 441.8	1.199	1,*g*								1	20	<25
13 442.6	1.170	2,*g*								3	21	<25
13 443.2	1.184	1,*g*								2	21	<25
13 443.6	1.173	2,*u*								3	21	<25
13 444.0	1.173	0,u^+								3	21	<25
13 444.2	1.184	1,*u*								2	21	<25
13 444.3	1.202	1,*u*								1	20	<25
13 444.4	1.172	0,g^+								3	21	<25
13 444.8	1.201	1,*g*								1	20	<25
13 444.9	1.213	2,*u*								0	20	<25
13 445.2	1.171	2,*u*								3	21	<25
13 445.3	1.188	2,*g*								2	20	<25
13 445.6	1.184	1,*u*								2	21	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 446.6	1.198	2,*u*								1	21	<25
13 446.7	1.198	2,*g*								1	21	<25
13 446.7	1.170	0,u^-	0	0	3	4	−2	2	2	3	21	25
13 448.3	1.173	2,*u*								3	21	<25
13 448.4	1.155	0,u^+	0	5	0	3	3	3	−3	5	21	26
		0,u^+	0	5	0	3	1	3	−1	5	21	38
13 448.8	1.201	1,*u*								1	20	<25
13 450.8	1.161	1,*u*	0	3	1	5	3	2	−2	4	21	27
13 451.4	1.184	1,*g*								2	21	<25
13 451.5	1.173	0,u^-	0	2	1	8	−2	2	2	3	21	37
13 452.1	1.172	2,*g*								3	21	<25
13 452.8	1.173	2,*u*								3	21	<25
13 453.0	1.215	0,g^+								0	20	<25
13 453.0	1.190	0,g^+	0	1	1	1	1	11	−1	2	20	56
13 453.1	1.191	2,*u*								2	20	<25
13 454.9	1.213	1,*g*								0	21	<25
13 454.9	1.213	1,*u*								0	21	<25
13 455.7	1.165	1,*g*								4	21	<25
13 456.1	1.171	0,g^+								3	21	<25
13 456.3	1.200	0,u^-								1	21	<25
13 456.3	1.200	0,g^-								1	21	<25
13 456.6	1.172	0,u^+								3	21	<25
13 457.0	1.184	1,*g*								2	21	<25
13 457.0	1.165	1,*u*	0	4	0	6	2	3	−1	4	21	26
13 457.0	1.184	1,*u*								2	21	<25
13 457.1	1.214	2,*u*								0	20	<25
13 457.2	1.163	1,*u*								4	21	<25
13 457.8	1.189	0,g^-	1	1	0	2	−2	10	2	2	20	52
13 458.1	1.186	0,u^+	2	0	0	1	1	9	−1	2	20	41
		0,u^+	1	0	1	0	0	10	0	2	20	35
13 458.6	1.171	0,g^+								3	21	<25
13 458.9	1.174	0,g^-								3	21	<25
13 459.2	1.173	2,*u*								3	21	<25
13 459.5	1.174	0,u^-								3	21	<25
13 460.2	1.171	2,*g*								3	21	<25
13 460.4	1.215	2,*g*								0	20	<25
13 462.6	1.172	2,*g*								3	21	<25
13 463.0	1.153	2,*u*								5	21	<25
13 463.1	1.200	2,*u*								1	21	<25
13 463.1	1.200	2,*g*								1	21	<25
13 463.6	1.172	0,g^-								3	21	<25
13 463.9	1.190	2,*g*								2	20	<25
13 464.5	1.168	0,g^+	1	3	0	0	0	6	0	4	20	33
		0,g^+	0	4	0	0	0	8	0	4	20	63
13 465.1	1.201	1,*g*								1	20	<25
13 466.1	1.184	1,*g*								2	21	<25
13 466.1	1.171	0,u^+	1	0	2	3	3	3	−3	3	21	43
13 466.1	1.153	0,g^-	0	4	1	3	−1	1	1	5	21	91
13 466.2	1.177	1,*g*	1	2	0	1	1	8	0	3	20	32
		1,*g*	1	2	0	1	−1	8	2	3	20	31
13 466.3	1.161	1,*g*								4	21	<25
13 466.5	1.214	1,*u*								0	21	<25
13 466.5	1.214	1,*g*								0	21	<25
13 466.6	1.172	2,*g*								3	21	<25
13 466.9	1.174	2,*u*								3	21	<25
13 467.9	1.173	0,g^-								3	21	<25
13 468.2	1.201	1,*g*								1	20	<25
13 468.3	1.174	2,*g*								3	21	<25
13 468.5	1.185	0,g^+								2	20	<25
13 469.3	1.171	2,*u*								3	21	<25
13 469.5	1.186	1,*g*								2	21	<25
13 469.7	1.156	0,u^-	0	5	0	3	−3	3	3	5	21	77
13 469.9	1.186	1,*u*								2	21	<25
13 470.0	1.199	0,g^+								1	21	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 470.1	1.199	$0,u^+$								1	21	<25
13 470.5	1.199	$0,u^-$								1	21	<25
13 470.5	1.199	$0,u^-$								1	21	<25
13 471.1	1.185	$1,u$								2	21	<25
13 471.2	1.152	$2,g$	0	4	1	3	3	1	−1	5	21	33
		$2,g$	0	4	1	3	1	1	1	5	21	48
13 472.2	1.186	$2,u$	1	0	1	0	0	10	2	2	20	34
13 472.4	1.189	$2,g$								2	20	<25
13 473.6	1.151	$0,u^+$	1	3	1	2	0	0	0	5	21	42
13 474.0	1.172	$2,g$								3	21	<25
13 474.4	1.199	$2,u$								1	21	<25
13 474.7	1.173	$0,g^+$								3	21	<25
13 474.8	1.199	$2,g$								1	21	<25
13 475.0	1.161	$1,u$	0	2	2	4	0	1	1	4	21	26
13 475.6	1.186	$1,g$								2	21	<25
13 475.8	1.172	$2,g$								3	21	<25
13 476.1	1.200	$1,g$								1	20	<25
13 476.7	1.162	$1,g$								4	21	<25
13 477.3	1.168	$2,g$	1	3	0	0	0	6	2	4	20	32
		$2,g$	0	4	0	0	0	8	2	4	20	64
13 477.3	1.185	$1,u$								2	21	<25
13 477.5	1.173	$2,u$								3	21	<25
13 477.7	1.150	$0,g^+$	0	3	2	2	0	0	0	5	21	50
		$0,g^+$	0	4	1	3	1	1	−1	5	21	36
13 477.8	1.184	$1,g$								2	21	<25
13 478.0	1.190	$0,g^+$								2	20	<25
13 478.6	1.172	$0,u^-$								3	21	<25
13 479.1	1.172	$0,g^-$								3	21	<25
13 479.4	1.172	$0,u^-$								3	21	<25
13 480.3	1.184	$1,u$								2	21	<25
13 480.6	1.185	$2,g$								2	20	<25
13 480.9	1.188	$0,u^-$								2	20	<25
13 481.0	1.173	$2,u$								3	21	<25
13 481.2	1.185	$1,u$								2	21	<25
13 481.3	1.170	$2,g$								3	21	<25
13 481.4	1.184	$1,g$								2	21	<25
13 481.5	1.163	$1,u$	0	3	1	5	−1	2	2	4	21	35
13 481.5	1.174	$0,u^+$	1	2	0	7	1	3	−1	3	21	27
13 481.6	1.170	$0,g^+$								3	21	<25
13 481.9	1.150	$2,g$	0	3	2	2	2	0	0	5	21	47
		$2,g$	0	4	1	3	1	1	1	5	21	33
13 483.2	1.198	$2,g$								1	21	<25
13 483.4	1.152	$2,u$	1	3	1	2	2	0	0	5	21	36
13 483.4	1.199	$2,u$								1	21	<25
13 483.9	1.202	$1,u$								1	20	<25
13 484.4	1.202	$1,g$								1	20	<25
13 484.6	1.201	$1,u$								1	20	<25
13 485.0	1.171	$0,g^+$								3	21	<25
13 485.2	1.214	$0,g^-$								0	20	<25
13 485.3	1.212	$0,g^+$								0	20	<25
13 485.8	1.172	$2,u$								3	21	<25
13 485.8	1.173	$0,g^-$								3	21	<25
13 486.4	1.213	$2,g$								0	20	<25
13 486.6	1.214	$2,u$								0	20	<25
13 486.6	1.184	$1,u$								2	21	<25
13 487.0	1.157	$1,g$	0	0	4	1	1	0	0	4	21	33
13 488.0	1.190	$0,u^+$	1	1	0	1	1	11	−1	2	20	34
13 488.1	1.185	$1,g$								2	21	<25
13 488.4	1.190	$2,g$								2	20	<25
13 488.5	1.172	$2,g$								3	21	<25
13 488.6	1.158	$1,g$								4	21	<25
13 488.8	1.214	$2,g$								0	20	<25
13 488.8	1.198	$0,u^-$								1	21	<25
13 488.9	1.198	$0,g^-$								1	21	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 489.0	1.163	1,*u*								4	21	<25
13 490.3	1.188	2,*u*								2	20	<25
13 491.0	1.198	2,*u*								1	21	<25
13 491.1	1.173	2,*g*								3	21	<25
13 491.2	1.174	1,*u*	2	1	0	0	0	7	1	3	20	56
13 491.2	1.198	2,*g*								1	21	<25
13 492.1	1.199	$0,u^+$								1	21	<25
13 492.1	1.199	$0,g^+$								1	21	<25
13 492.4	1.174	$0,u^+$								3	21	<25
13 493.5	1.161	1,*g*								4	21	<25
13 494.4	1.179	1,*g*	0	2	1	0	0	9	1	3	20	84
13 496.1	1.185	1,*u*								2	21	<25
13 496.1	1.175	$0,g^+$								3	21	<25
13 496.7	1.155	$0,u^+$	0	5	0	3	3	3	−3	5	21	46
		$0,u^+$	0	5	0	3	1	3	−1	5	21	33
13 497.0	1.184	1,*g*								2	21	<25
13 497.2	1.185	1,*u*								2	21	<25
13 498.1	1.201	1,*u*								1	20	<25
13 498.5	1.199	2,*g*								1	21	<25
13 498.5	1.173	2,*u*								3	21	<25
13 498.5	1.199	2,*u*								1	21	<25
13 498.8	1.173	2,*g*								3	21	<25
13 499.4	1.190	$0,u^+$								2	20	<25
13 500.1	1.185	1,*g*								2	21	<25
13 500.2	1.189	2,*u*								2	20	<25
13 500.3	1.185	1,*u*								2	21	<25
13 500.4	1.160	1,*g*	2	2	0	5	1	0	0	4	21	32
13 500.5	1.174	$0,g^-$	0	2	1	7	−3	3	3	3	21	28
13 501.0	1.154	2,*u*	0	5	0	3	3	3	−1	5	21	27
		2,*u*	0	5	0	3	−1	3	3	5	21	29
13 501.5	1.214	$0,u^-$								0	20	<25
13 502.0	1.214	$0,g^+$								0	20	<25
13 502.2	1.185	1,*g*								2	21	<25
13 502.7	1.201	1,*g*								1	20	<25
13 502.8	1.175	$0,u^-$								3	21	<25
13 503.1	1.213	2,*g*								0	20	<25
13 503.9	1.157	1,*u*	2	1	1	3	1	0	0	4	21	45
		1,*u*	0	1	3	3	1	0	0	4	21	25
13 504.2	1.171	2,*g*								3	21	<25
13 504.3	1.171	$0,u^+$								3	21	<25
13 505.8	1.185	1,*u*								2	21	<25
13 505.8	1.214	$0,u^+$								0	20	<25
13 506.2	1.166	1,*g*								4	21	<25
13 507.1	1.170	$0,g^-$								3	21	<25
13 507.3	1.200	1,*u*								1	20	<25
13 507.4	1.171	2,*u*								3	21	<25
13 507.5	1.133	$0,g^+$	0	7	0	0	0	0	0	7	21	100
13 507.9	1.186	1,*g*								2	21	<25
13 508.0	1.214	$0,g^-$								0	20	<25
13 508.5	1.212	1,*u*								0	19	<25
13 508.5	1.212	1,*g*								0	19	<25
13 508.6	1.192	$0,g^-$	0	2	0	2	−2	12	2	2	20	41
13 508.7	1.198	2,*g*								1	21	<25
13 509.0	1.174	$0,u^-$	1	2	0	7	−3	3	3	3	21	45
13 509.0	1.151	$0,u^+$	1	4	0	3	1	1	−1	5	21	52
13 510.0	1.175	2,*g*								3	21	<25
13 511.0	1.175	2,*u*								3	21	<25
13 511.4	1.184	1,*g*								2	21	<25
13 511.4	1.190	2,*u*								2	20	<25
13 511.6	1.186	1,*u*								2	21	<25
13 511.7	1.151	2,*u*	1	3	1	2	2	0	0	5	21	31
		2,*u*	1	4	0	3	3	1	−1	5	21	39
13 511.8	1.162	1,*g*	1	3	0	5	−1	2	2	4	21	28
13 512.0	1.152	$0,u^-$	1	4	0	3	−1	1	1	5	21	83

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 512.2	1.213	1,u								0	21	<25
13 512.2	1.213	1,g								0	21	<25
13 512.3	1.173	0,u^+								3	21	<25
13 513.0	1.174	0,g^+								3	21	<25
13 513.6	1.197	0,u^+								1	21	<25
13 514.0	1.173	2,u								3	21	<25
13 514.1	1.198	0,g^+								1	21	<25
13 514.7	1.163	1,g								4	21	<25
13 515.0	1.185	1,g								2	21	<25
13 515.5	1.198	2,u								1	21	<25
13 516.7	1.216	0,u^+	0	0	0	1	1	19	−1	0	20	44
13 516.8	1.185	1,u								2	21	<25
13 517.9	1.185	1,g								2	21	<25
13 518.1	1.171	0,u^+								3	21	<25
13 518.3	1.163	1,u								4	21	<25
13 519.4	1.141	1,u	0	5	1	1	1	0	0	6	21	98
13 519.5	1.171	2,u								3	21	<25
13 519.8	1.185	1,u								2	21	<25
13 520.3	1.173	0,g^+								3	21	<25
13 520.6	1.192	2,g	0	2	0	2	−2	12	4	2	20	26
13 521.0	1.200	0,u^+								1	21	<25
13 521.0	1.200	0,g^+								1	21	<25
13 521.1	1.215	2,u								0	20	<25
13 521.2	1.171	2,u								3	21	<25
13 521.3	1.171	0,u^+								3	21	<25
13 521.6	1.201	1,u								1	20	<25
13 521.9	1.185	1,u								2	21	<25
13 522.0	1.152	2,u	1	4	0	3	1	1	1	5	21	66
13 522.1	1.181	1,g	0	3	0	1	1	10	0	3	20	35
		1,g	0	3	0	1	−1	10	2	3	20	37
13 522.2	1.185	1,g								2	21	<25
13 523.5	1.173	2,u								3	21	<25
13 523.7	1.173	2,g								3	21	<25
13 525.3	1.173	2,g								3	21	<25
13 525.7	1.198	2,g								1	21	<25
13 525.7	1.198	2,u								1	21	<25
13 526.6	1.164	1,u								4	21	<25
13 526.7	1.198	0,u^+								1	21	<25
13 526.8	1.185	1,u								2	21	<25
13 526.8	1.198	0,g^+								1	21	<25
13 527.4	1.198	2,g								1	21	<25
13 528.7	1.173	0,g^+								3	21	<25
13 529.8	1.185	1,g								2	21	<25
13 530.2	1.185	1,u								2	21	<25
13 530.3	1.199	0,g^-								1	21	<25
13 530.6	1.174	2,u								3	21	<25
13 531.0	1.199	0,u^-								1	21	<25
13 531.3	1.199	2,u								1	21	<25
13 531.8	1.199	2,g								1	21	<25
13 531.8	1.185	0,u^-	2	0	0	1	−1	9	1	2	20	56
13 531.9	1.185	1,g								2	21	<25
13 531.9	1.171	0,g^+	0	0	3	3	1	3	−1	3	21	30
13 533.6	1.174	2,g								3	21	<25
13 533.7	1.147	0,u^+	0	2	3	0	0	0	0	5	21	54
13 534.1	1.201	1,g								1	20	<25
13 534.2	1.185	1,g								2	21	<25
13 534.5	1.202	1,u								1	20	<25
13 535.1	1.213	2,g								0	20	<25
13 535.4	1.171	0,u^-								3	21	<25
13 535.6	1.199	0,u^+								1	21	<25
13 535.6	1.176	0,g^-								3	21	<25
13 535.9	1.175	0,g^+								3	21	<25
13 536.0	1.186	1,u								2	21	<25
13 536.0	1.198	0,g^-								1	21	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 536.1	1.198	2,*u*								1	21	<25
13 536.2	1.214	2,*u*								0	20	<25
13 536.3	1.199	0,g^+								1	21	<25
13 536.6	1.185	1,*g*								2	21	<25
13 536.8	1.174	0,g^-								3	21	<25
13 537.5	1.199	2,*g*								1	21	<25
13 538.5	1.173	0,u^+								3	21	<25
13 538.6	1.186	1,*u*								2	21	<25
13 538.6	1.173	2,*g*								3	21	<25
13 538.6	1.198	0,u^-								1	21	<25
13 539.1	1.162	1,*u*								4	21	<25
13 539.2	1.198	2,*u*								1	21	<25
13 539.3	1.213	0,u^-								0	20	<25
13 540.1	1.192	0,u^+	1	1	0	1	1	11	−1	2	20	27
		0,u^+	0	2	0	1	1	13	−1	2	20	41
13 540.1	1.156	0,u^-	0	5	0	3	−1	3	1	5	21	83
13 540.7	1.201	1,*g*								1	20	<25
13 540.9	1.169	2,*u*								3	21	<25
13 541.3	1.173	0,u^-								3	21	<25
13 542.1	1.186	1,*g*								2	21	<25
13 542.4	1.214	1,*u*								0	21	<25
13 542.4	1.214	1,*g*								0	21	<25
13 542.4	1.188	0,g^+	1	1	0	0	0	12	0	2	20	27
13 543.1	1.178	1,*u*	1	2	0	0	0	9	1	3	20	40
		1,*u*	0	3	0	0	0	11	1	3	20	26
13 543.3	1.160	1,*g*	1	1	2	1	1	2	0	4	21	26
13 544.0	1.174	2,*g*								3	21	<25
13 544.2	1.185	1,*u*								2	21	<25
13 544.3	1.185	2,*u*	2	0	0	1	1	9	1	2	20	31
		2,*u*	2	0	0	1	−1	9	3	2	20	25
13 544.9	1.146	0,g^+	1	2	2	0	0	0	0	5	21	84
13 545.0	1.185	1,*g*								2	21	<25
13 545.3	1.174	0,g^-	0	1	2	4	−4	4	4	3	21	29
13 545.7	1.174	2,*g*								3	21	<25
13 546.2	1.173	0,u^-								3	21	<25
13 546.3	1.198	2,*g*								1	21	<25
13 546.7	1.160	1,*g*	1	1	2	1	−1	2	2	4	21	30
13 547.0	1.172	2,*g*								3	21	<25
13 547.1	1.198	0,g^+								1	21	<25
13 547.2	1.174	0,g^+								3	21	<25
13 547.7	1.162	1,*u*								4	21	<25
13 548.1	1.156	2,*u*	0	5	0	3	1	3	1	5	21	56
13 548.4	1.184	1,*u*								2	21	<25
13 548.6	1.173	2,*u*								3	21	<25
13 548.9	1.160	1,*u*								4	21	<25
13 548.9	1.172	0,u^+								3	21	<25
13 549.1	1.192	0,u^-	0	2	0	1	−1	13	1	2	20	40
13 550.0	1.214	2,*u*								0	20	<25
13 550.0	1.163	1,*g*	0	3	1	4	4	3	−3	4	21	36
13 550.2	1.198	2,*u*								1	21	<25
13 550.7	1.170	0,u^-								3	21	<25
13 550.8	1.214	0,u^-								0	20	<25
13 550.9	1.203	1,*g*								1	20	<25
13 551.0	1.175	2,*g*								3	21	<25
13 551.1	1.214	0,g^+								0	20	<25
13 551.3	1.199	0,u^+								1	21	<25
13 551.5	1.172	0,u^+								3	21	<25
13 551.7	1.185	1,*u*								2	21	<25
13 552.2	1.171	2,*u*								3	21	<25
13 552.6	1.192	2,*u*	0	2	0	1	1	13	1	2	20	30
13 552.8	1.198	0,u^-								1	21	<25
13 553.1	1.185	1,*g*								2	21	<25
13 553.2	1.198	2,*g*								1	21	<25
13 553.3	1.198	2,*u*								1	21	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 553.6	1.188	2,g								2	20	<25
13 553.8	1.198	0,g^+								1	21	<25
13 554.9	1.185	1,u								2	21	<25
13 555.2	1.198	0,u^+								1	21	<25
13 555.2	1.199	0,g^-								1	21	<25
13 555.5	1.190	0,g^-	0	1	1	1	−1	11	1	2	20	48
13 555.6	1.176	0,g^+								3	21	<25
13 556.0	1.173	0,u^-								3	21	<25
13 556.5	1.174	2,u								3	21	<25
13 557.4	1.198	2,u								1	21	<25
13 557.6	1.167	0,g^+	3	0	0	6	0	0	0	3	21	43
13 557.8	1.185	1,g								2	21	<25
13 558.0	1.198	2,g								1	21	<25
13 558.3	1.202	1,u								1	20	<25
13 558.8	1.213	1,g								0	21	<25
13 558.8	1.213	1,u								0	21	<25
13 559.0	1.214	2,g								0	20	<25
13 559.3	1.167	2,g	3	0	0	6	2	0	0	3	21	45
13 559.4	1.186	1,u								2	21	<25
13 559.5	1.199	2,g								1	21	<25
13 559.7	1.173	2,u								3	21	<25
13 559.9	1.214	2,u								0	20	<25
13 559.9	1.176	0,u^+								3	21	<25
13 560.3	1.185	1,g								2	21	<25
13 560.4	1.198	2,g								1	21	<25
13 561.0	1.192	2,u	0	2	0	1	−1	13	3	2	20	32
13 561.3	1.143	1,g	1	5	0	1	1	0	0	6	21	42
		1,g	0	6	0	1	1	2	0	6	21	36
13 561.6	1.199	0,g^+								1	21	<25
13 561.6	1.152	0,u^+	0	4	1	2	2	2	−2	5	21	36
13 562.2	1.172	2,u								3	21	<25
13 562.7	1.171	0,g^-	1	0	2	2	−2	4	2	3	21	45
13 563.6	1.185	1,g								2	21	<25
13 563.9	1.199	2,u								1	21	<25
13 564.1	1.177	2,g								3	21	<25
13 564.4	1.185	1,u								2	21	<25
13 564.8	1.199	0,u^-	0	0	1	8	−8	8	8	1	21	26
13 566.0	1.174	0,g^-	1	2	0	6	−4	4	4	3	21	49
13 566.1	1.186	1,u								2	21	<25
13 566.3	1.176	0,u^+								3	21	<25
13 566.4	1.190	2,g								2	20	<25
13 566.8	1.171	2,u								3	21	<25
13 566.8	1.172	0,g^+								3	21	<25
13 567.2	1.162	1,g								4	21	<25
13 567.2	1.201	1,u								1	20	<25
13 567.5	1.184	1,u								2	21	<25
13 567.8	1.198	2,u								1	21	<25
13 567.9	1.199	0,u^+	0	0	1	8	8	8	−8	1	21	25
13 568.1	1.173	2,g								3	21	<25
13 568.4	1.172	2,g								3	21	<25
13 568.5	1.185	1,g								2	21	<25
13 568.7	1.160	1,g	1	1	2	1	−1	2	2	4	21	26
13 568.7	1.170	0,u^-								3	21	<25
13 569.0	1.201	1,g								1	20	<25
13 569.0	1.197	0,g^-								1	21	<25
13 570.1	1.164	1,u								4	21	<25
13 570.1	1.198	0,u^-								1	21	<25
13 570.2	1.167	1,g	0	4	0	5	1	4	0	4	21	34
13 570.3	1.198	2,g								1	21	<25
13 570.3	1.198	0,g^-								1	21	<25
13 570.5	1.185	1,g								2	21	<25
13 571.2	1.198	2,u								1	21	<25
13 572.3	1.175	2,u								3	21	<25
13 572.5	1.173	0,u^+								3	21	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 573.0	1.197	$0,u^+$								1	21	<25
13 573.1	1.186	$1,g$								2	21	<25
13 573.8	1.187	$0,g^+$	2	0	0	0	0	10	0	2	20	44
13 574.1	1.152	$0,u^-$	0	3	2	1	−1	1	1	5	21	29
		$0,u^-$	0	4	1	2	−2	2	2	5	21	58
13 574.2	1.172	$0,g^+$								3	21	<25
13 574.3	1.143	$1,g$	1	5	0	1	1	0	0	6	21	47
		$1,g$	0	6	0	1	−1	2	2	6	21	46
13 574.5	1.198	$0,u^-$								1	21	<25
13 574.6	1.202	$1,g$								1	20	<25
13 575.4	1.163	$1,u$								4	21	<25
13 575.5	1.174	$2,g$								3	21	<25
13 575.7	1.198	$2,g$								1	21	<25
13 576.7	1.173	$2,u$								3	21	<25
13 577.1	1.170	$2,g$								3	21	<25
13 577.1	1.185	$1,u$								2	21	<25
13 577.2	1.161	$1,u$								4	21	<25
13 577.2	1.198	$2,u$	1	0	0	9	9	7	−7	1	21	45
13 579.6	1.191	$0,u^+$	0	1	1	0	0	12	0	2	20	58
13 580.3	1.185	$1,u$								2	21	<25
13 580.5	1.198	$0,g^+$								1	21	<25
13 581.3	1.172	$0,u^+$								3	21	<25
13 581.7	1.152	$2,u$	0	3	2	1	1	1	1	5	21	26
		$2,u$	0	4	1	2	2	2	0	5	21	39
13 582.0	1.216	$0,g^+$	0	0	0	0	0	20	0	0	20	35
13 582.1	1.173	$0,g^+$								3	21	<25
13 582.9	1.185	$1,g$								2	21	<25
13 583.2	1.161	$1,u$								4	21	<25
13 583.5	1.198	$2,g$								1	21	<25
13 583.8	1.173	$2,u$								3	21	<25
13 584.2	1.213	$1,u$								0	21	<25
13 584.2	1.213	$1,g$								0	21	<25
13 584.2	1.175	$0,g^-$								3	21	<25
13 584.5	1.173	$0,u^+$								3	21	<25
13 585.9	1.202	$1,u$								1	20	<25
13 586.1	1.174	$2,g$								3	21	<25
13 586.3	1.202	$1,g$								1	20	<25
13 586.6	1.175	$2,u$								3	21	<25
13 586.8	1.153	$0,g^+$								5	21	<25
13 586.9	1.199	$0,g^-$								1	21	<25
13 587.1	1.199	$0,u^+$								1	21	<25
13 587.2	1.162	$1,g$								4	21	<25
13 587.4	1.187	$2,g$	2	0	0	0	0	10	2	2	20	44
13 588.1	1.198	$2,g$								1	21	<25
13 588.7	1.153	$1,u$	3	0	1	1	1	0	0	4	21	50
13 588.9	1.145	$1,g$	0	6	0	1	1	2	0	6	21	57
		$1,g$	0	6	0	1	−1	2	2	6	21	34
13 589.1	1.186	$1,u$								2	21	<25
13 589.3	1.198	$2,u$								1	21	<25
13 589.3	1.186	$1,g$								2	21	<25
13 589.6	1.215	$2,g$	0	0	0	0	0	20	2	0	20	27
13 589.7	1.198	$0,g^+$								1	21	<25
13 591.7	1.191	$2,u$	0	1	1	0	0	12	2	2	20	58
13 591.8	1.171	$0,g^+$								3	21	<25
13 591.9	1.198	$2,u$								1	21	<25
13 592.0	1.170	$0,u^+$								3	21	<25
13 592.2	1.186	$1,u$								2	21	<25
13 592.5	1.171	$0,g^-$	2	1	0	6	−2	2	2	3	21	40
13 593.0	1.214	$0,g^-$	0	0	0	2	−2	18	2	0	20	33
13 593.0	1.177	$0,u^-$								3	21	<25
13 593.6	1.171	$2,u$								3	21	<25
13 593.7	1.186	$1,g$								2	21	<25
13 593.8	1.163	$1,u$								4	21	<25
13 594.0	1.186	$1,g$								2	21	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 594.8	1.198	$0,u^+$								1	21	<25
13 595.1	1.198	$0,g^+$								1	21	<25
13 595.7	1.171	$2,u$								3	21	<25
13 596.2	1.162	$1,g$								4	21	<25
13 596.4	1.184	$1,u$								2	21	<25
13 596.6	1.198	$2,u$								1	21	<25
13 596.8	1.186	$1,g$								2	21	<25
13 596.8	1.215	$0,u^+$	0	0	0	1	1	19	−1	0	20	25
13 596.8	1.173	$0,g^+$	1	2	0	6	4	4	−4	3	21	25
13 597.5	1.213	$1,g$								0	21	<25
13 597.5	1.160	$1,g$								4	21	<25
13 597.6	1.213	$1,u$								0	21	<25
13 597.7	1.201	$0,u^-$								1	21	<25
13 598.0	1.172	$2,g$								3	21	<25
13 598.1	1.185	$1,g$								2	21	<25
13 598.4	1.186	$1,u$								2	21	<25
13 599.0	1.185	$1,u$								2	21	<25
13 599.0	1.199	$2,g$								1	21	<25
13 599.4	1.181	$1,u$	1	2	0	0	0	9	1	3	20	30
		$1,u$	0	3	0	0	0	11	1	3	20	62
13 600.0	1.200	$0,g^-$								1	21	<25
13 600.7	1.192	$0,g^+$	0	2	0	0	0	14	0	2	20	42
13 600.8	1.198	$2,u$								1	21	<25
13 601.0	1.186	$1,u$								2	21	<25
13 601.2	1.175	$0,g^+$								3	21	<25
13 601.3	1.199	$2,g$								1	21	<25
13 601.5	1.186	$1,u$								2	21	<25
13 601.7	1.198	$0,u^+$								1	21	<25
13 602.4	1.172	$2,g$								3	21	<25
13 602.9	1.160	$1,u$	2	2	0	4	0	1	1	4	21	32
13 603.2	1.185	$1,g$								2	21	<25
13 603.9	1.174	$2,g$								3	21	<25
13 604.3	1.174	$0,u^-$	0	1	2	5	−1	3	1	3	21	27
13 604.5	1.200	$2,u$								1	21	<25
13 604.9	1.199	$0,g^+$								1	21	<25
13 605.6	1.153	$2,g$								5	21	<25
13 606.0	1.215	$2,g$	0	0	0	2	−2	18	4	0	20	26
13 606.3	1.175	$0,g^+$								3	21	<25
13 606.8	1.185	$1,u$								2	21	<25
13 607.0	1.215	$2,u$								0	20	<25
13 607.0	1.172	$2,u$								3	21	<25
13 607.1	1.153	$0,u^+$	0	4	1	2	2	2	−2	5	21	33
		$0,u^+$	0	4	1	2	0	2	0	5	21	60
13 607.7	1.174	$0,u^-$	1	2	0	7	−1	3	1	3	21	29
13 607.9	1.171	$2,g$								3	21	<25
13 607.9	1.199	$2,g$								1	21	<25
13 608.1	1.163	$1,u$								4	21	<25
13 608.4	1.199	$2,g$								1	21	<25
13 608.5	1.185	$1,u$								2	21	<25
13 608.6	1.187	$1,g$								2	21	<25
13 608.7	1.199	$2,u$								1	21	<25
13 609.1	1.170	$2,u$	3	0	0	5	3	1	−1	3	21	32
13 610.5	1.185	$1,g$								2	21	<25
13 610.6	1.173	$0,g^-$	1	1	1	5	−1	3	1	3	21	28
13 610.8	1.199	$0,g^-$								1	21	<25
13 610.9	1.173	$2,g$								3	21	<25
13 611.6	1.163	$1,g$								4	21	<25
13 611.6	1.199	$0,u^-$								1	21	<25
13 612.2	1.189	$0,u^-$	1	1	0	1	−1	11	1	2	20	53
13 612.3	1.215	$1,g$								0	21	<25
13 612.3	1.163	$1,u$								4	21	<25
13 612.3	1.169	$0,u^+$	3	0	0	5	1	1	−1	3	21	39
13 612.3	1.152	$0,g^-$	1	3	1	1	−1	1	1	5	21	30
		$0,g^-$	1	4	0	2	−2	2	2	5	21	50

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 612.4	1.215	1,*u*								0	21	<25
13 612.4	1.187	1,*u*								2	21	<25
13 612.7	1.170	0,g^-	2	0	1	3	−3	3	3	3	21	38
13 612.9	1.201	1,*u*								1	20	<25
13 613.3	1.173	2,*g*								3	21	<25
13 613.4	1.198	0,u^+								1	21	<25
13 613.5	1.192	2,*g*	0	2	0	0	0	14	2	2	20	42
13 613.7	1.185	1,*g*								2	21	<25
13 613.9	1.174	2,*u*								3	21	<25
13 613.9	1.153	0,g^+	0	5	0	2	2	4	−2	5	21	30
13 614.6	1.185	1,*g*								2	21	<25
13 615.1	1.153	2,*u*	0	4	1	2	2	2	0	5	21	48
		2,*u*	0	4	1	2	0	2	2	5	21	37
13 615.6	1.199	0,u^-	1	0	0	9	−7	7	7	1	21	26
13 615.9	1.171	0,u^+								3	21	<25
13 616.4	1.151	0,u^+	0	3	2	1	1	1	−1	5	21	55
13 617.7	1.173	2,*u*								3	21	<25
13 617.8	1.185	1,*g*								2	21	<25
13 618.5	1.199	2,*u*								1	21	<25
13 619.5	1.154	1,*u*	0	0	4	0	0	1	1	4	21	40
13 619.5	1.174	0,g^+								3	21	<25
13 619.6	1.175	2,*g*								3	21	<25
13 619.8	1.157	1,*g*	2	1	1	2	0	1	1	4	21	33
13 619.8	1.197	2,*g*								1	21	<25
13 619.9	1.201	1,*g*								1	20	<25
13 620.1	1.186	1,*u*								2	21	<25
13 620.2	1.186	1,*g*								2	21	<25
13 620.2	1.198	2,*u*								1	21	<25
13 620.4	1.172	2,*u*	2	1	0	5	5	3	−3	3	21	33
13 620.6	1.151	0,u^-	0	3	2	1	−1	1	1	5	21	59
		0,u^-	0	4	1	2	−2	2	2	5	21	30
13 621.4	1.202	1,*u*								1	20	<25
13 621.4	1.174	0,g^-	0	2	1	5	−5	5	5	3	21	30
13 622.5	1.165	1,*u*								4	21	<25
13 622.5	1.199	0,u^+								1	21	<25
13 623.2	1.199	2,*g*								1	21	<25
13 623.9	1.174	0,u^-								3	21	<25
13 624.3	1.189	2,*u*	1	1	0	1	1	11	1	2	20	28
13 624.5	1.199	0,g^+								1	21	<25
13 624.7	1.186	1,*g*								2	21	<25
13 624.9	1.199	0,g^-								1	21	<25
13 625.0	1.152	2,*g*	2	3	0	2	2	0	0	5	21	38
13 625.0	1.199	0,u^-								1	21	<25
13 625.7	1.202	1,*g*								1	20	<25
13 626.0	1.186	1,*u*								2	21	<25
13 626.9	1.186	1,*g*								2	21	<25
13 626.9	1.199	2,*g*								1	21	<25
13 627.4	1.202	1,*u*								1	20	<25
13 627.4	1.185	1,*u*								2	21	<25
13 627.5	1.175	2,*u*								3	21	<25
13 627.6	1.213	1,*g*	0	0	0	11	11	10	−10	0	21	38
13 628.1	1.199	2,*u*								1	21	<25
13 628.2	1.171	0,g^+								3	21	<25
13 628.3	1.175	0,u^+								3	21	<25
13 628.7	1.164	1,*u*								4	21	<25
13 628.7	1.197	0,g^+								1	21	<25
13 629.8	1.213	1,*u*								0	21	<25
13 629.8	1.198	0,u^+								1	21	<25
13 630.1	1.151	2,*u*	0	3	2	1	1	1	1	5	21	53
		2,*u*	0	4	1	2	0	2	2	5	21	31
13 630.2	1.202	1,*g*								1	20	<25
13 630.4	1.197	0,g^+								1	21	<25
13 630.5	1.186	1,*g*								2	21	<25
13 630.9	1.177	0,u^+	0	3	0	5	5	7	−5	3	21	32

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 631.1	1.149	$0,g^+$	2	3	0	2	0	0	0	5	21	60
13 633.3	1.175	$0,u^+$								3	21	<25
13 633.6	1.174	$2,g$								3	21	<25
13 634.0	1.198	$2,g$								1	21	<25
13 634.1	1.199	$0,g^+$								1	21	<25
13 634.3	1.164	$1,u$								4	21	<25
13 634.8	1.200	$0,g^-$								1	21	<25
13 635.3	1.200	$0,u^-$								1	21	<25
13 635.5	1.174	$2,u$								3	21	<25
13 635.9	1.186	$1,g$								2	21	<25
13 636.4	1.186	$1,u$								2	21	<25
13 636.5	1.198	$2,u$								1	21	<25
13 636.7	1.167	$0,u^-$	3	0	0	5	−1	1	1	3	21	57
13 636.8	1.198	$0,u^+$								1	21	<25
13 637.3	1.198	$2,u$								1	21	<25
13 637.4	1.199	$2,g$								1	21	<25
13 637.4	1.186	$1,g$								2	21	<25
13 637.7	1.170	$0,g^+$								3	21	<25
13 638.4	1.174	$0,u^-$	1	2	0	5	−5	5	5	3	21	33
13 638.6	1.170	$2,g$								3	21	<25
13 639.1	1.154	$0,g^-$	1	3	1	1	−1	1	1	5	21	38
		$0,g^-$	0	5	0	2	−2	4	2	5	21	59
13 639.3	1.174	$0,g^+$								3	21	<25
13 639.4	1.186	$1,u$								2	21	<25
13 639.5	1.198	$0,g^-$	1	0	0	8	−8	8	8	1	21	30
13 640.6	1.198	$2,g$								1	21	<25
13 640.6	1.175	$0,g^-$	1	2	0	6	−2	4	2	3	21	28
13 641.1	1.186	$1,u$								2	21	<25
13 641.1	1.151	$2,g$	2	3	0	2	2	0	0	5	21	35
13 641.8	1.187	$1,g$								2	21	<25
13 642.0	1.174	$2,u$								3	21	<25
13 642.0	1.203	$1,u$	0	1	0	0	0	17	1	1	20	26
13 642.1	1.199	$2,u$								1	21	<25
13 642.5	1.173	$0,g^+$								3	21	<25
13 643.0	1.171	$2,g$								3	21	<25
13 643.1	1.172	$2,u$								3	21	<25
13 644.1	1.197	$2,g$								1	21	<25
13 644.2	1.186	$1,u$								2	21	<25
13 645.0	1.185	$1,g$								2	21	<25
13 645.4	1.163	$1,g$								4	21	<25
13 645.5	1.173	$0,u^+$								3	21	<25
13 645.9	1.154	$2,g$	0	5	0	2	2	4	0	5	21	30
13 645.9	1.173	$2,g$								3	21	<25
13 645.9	1.191	$0,g^+$	1	1	0	0	0	12	0	2	20	42
13 646.2	1.175	$2,u$								3	21	<25
13 646.4	1.198	$0,u^-$								1	21	<25
13 646.5	1.172	$2,u$								3	21	<25
13 646.7	1.173	$0,u^-$	2	1	0	5	−3	3	3	3	21	34
13 646.7	1.151	$0,g^+$	1	3	1	1	1	1	−1	5	21	43
		$0,g^+$	1	4	0	2	2	2	−2	5	21	35
13 647.0	1.213	$1,g$	0	0	0	11	11	10	−10	0	21	27
13 647.5	1.157	$1,g$	3	1	0	3	1	0	0	4	21	56
13 648.1	1.199	$0,g^+$	1	0	0	8	8	8	−8	1	21	30
13 648.2	1.214	$0,u^-$	0	0	0	1	−1	19	1	0	20	36
13 648.2	1.171	$0,u^+$	1	0	2	1	1	5	−1	3	21	33
		$0,u^+$	0	0	3	2	0	4	0	3	21	26
13 648.7	1.199	$2,u$								1	21	<25
13 648.8	1.175	$2,g$								3	21	<25
13 649.0	1.198	$0,u^+$								1	21	<25
13 649.3	1.185	$1,u$								2	21	<25
13 650.6	1.174	$2,g$								3	21	<25
13 650.9	1.198	$2,g$								1	21	<25
13 652.2	1.198	$0,g^+$								1	21	<25
13 652.4	1.186	$1,u$								2	21	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 652.5	1.163	1,*g*								4	21	<25
13 652.7	1.198	0,u^+								1	21	<25
13 652.8	1.199	0,g^-								1	21	<25
13 652.9	1.178	0,u^-								3	21	<25
13 652.9	1.153	0,g^+	1	4	0	2	0	2	0	5	21	58
13 653.8	1.213	1,*u*								0	21	<25
13 654.7	1.184	1,*u*	2	0	0	6	6	5	−5	2	21	37
13 655.3	1.199	2,*u*								1	21	<25
13 655.5	1.213	1,*g*								0	21	<25
13 655.6	1.152	0,g^-	1	3	1	1	−1	1	1	5	21	30
		0,g^-	1	4	0	2	−2	2	2	5	21	48
13 656.2	1.185	1,*g*								2	21	<25
13 656.4	1.199	2,*g*								1	21	<25
13 656.5	1.214	2,*u*								0	20	<25
13 656.8	1.214	2,*g*								0	20	<25
13 657.5	1.176	0,g^-								3	21	<25
13 657.6	1.170	0,g^+	1	0	2	2	0	4	0	3	21	25
		0,g^+	0	0	3	1	1	5	−1	3	21	27
13 657.7	1.191	2,*g*	1	1	0	0	0	12	2	2	20	43
13 658.2	1.213	1,*u*								0	21	<25
13 658.2	1.214	2,*u*								0	20	<25
13 658.2	1.175	0,u^+	1	2	0	5	5	5	−5	3	21	47
13 658.3	1.197	2,*u*								1	21	<25
13 658.4	1.198	0,u^+								1	21	<25
13 658.5	1.216	0,g^+	0	0	0	0	0	20	0	0	20	43
13 658.9	1.199	2,*g*								1	21	<25
13 659.3	1.163	1,*u*								4	21	<25
13 661.1	1.199	0,u^-								1	21	<25
13 661.4	1.178	2,*u*								3	21	<25
13 661.5	1.198	0,g^-								1	21	<25
13 661.5	1.200	0,g^+								1	21	<25
13 662.4	1.153	2,*g*	1	3	1	1	1	1	1	5	21	25
		2,*g*	1	4	0	2	2	2	0	5	21	35
13 662.5	1.198	2,*u*								1	21	<25
13 662.7	1.214	0,u^+								0	20	<25
13 662.7	1.214	0,g^-								0	20	<25
13 663.2	1.172	2,*u*								3	21	<25
13 664.4	1.174	2,*u*								3	21	<25
13 664.4	1.176	0,g^-								3	21	<25
13 664.5	1.200	0,u^-								1	21	<25
13 664.6	1.186	1,*g*								2	21	<25
13 665.1	1.169	2,*g*	3	0	0	4	4	2	−2	3	21	37
13 665.1	1.199	0,g^-								1	21	<25
13 665.3	1.185	1,*g*								2	21	<25
13 665.3	1.200	0,u^+								1	21	<25
13 665.4	1.174	0,u^-								3	21	<25
13 666.0	1.153	2,*g*	1	4	0	2	0	2	2	5	21	52
13 666.2	1.185	1,*u*								2	21	<25
13 666.5	1.200	2,*u*								1	21	<25
13 666.6	1.185	1,*u*								2	21	<25
13 666.7	1.198	2,*g*								1	21	<25
13 667.1	1.173	2,*u*								3	21	<25
13 668.4	1.163	1,*u*								4	21	<25
13 668.7	1.175	0,g^-								3	21	<25
13 668.8	1.216	2,*g*	0	0	0	0	0	20	2	0	20	44
13 669.2	1.198	0,g^+								1	21	<25
13 669.2	1.177	0,g^+								3	21	<25
13 670.0	1.186	1,*g*								2	21	<25
13 670.0	1.188	1,*u*								2	21	<25
13 670.1	1.213	1,*g*								0	21	<25
13 670.6	1.178	2,*g*								3	21	<25
13 670.8	1.200	0,g^+								1	21	<25
13 671.6	1.199	0,u^+								1	21	<25
13 671.8	1.160	1,*g*								4	21	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 671.9	1.175	2,u								3	21	<25
13 672.1	1.199	2,u								1	21	<25
13 672.3	1.199	2,g								1	21	<25
13 673.6	1.187	1,g								2	21	<25
13 673.8	1.187	1,u								2	21	<25
13 674.7	1.170	2,g								3	21	<25
13 675.4	1.186	1,g								2	21	<25
13 676.2	1.199	0,g^+								1	21	<25
13 676.6	1.174	2,g								3	21	<25
13 677.2	1.214	0,u^-								0	20	<25
13 677.2	1.214	0,g^+								0	20	<25
13 677.5	1.174	0,u^+								3	21	<25
13 677.6	1.215	1,u								0	21	<25
13 677.7	1.215	1,g								0	21	<25
13 677.7	1.169	0,g^-	2	0	1	3	−1	3	1	3	21	27
13 677.8	1.201	2,g								1	21	<25
13 678.2	1.187	1,u								2	21	<25
13 678.5	1.200	2,u								1	21	<25
13 679.0	1.187	1,g								2	21	<25
13 679.7	1.172	0,u^+								3	21	<25
13 679.8	1.162	1,g	2	2	0	3	3	2	−2	4	21	40
13 679.8	1.200	2,g								1	21	<25
13 679.8	1.174	2,g								3	21	<25
13 680.4	1.176	0,u^-								3	21	<25
13 680.5	1.193	0,u^-	0	2	0	1	−1	13	1	2	20	45
		0,u^-	0	2	0	3	−1	11	1	2	20	30
13 681.4	1.175	2,u								3	21	<25
13 681.5	1.186	1,g								2	21	<25
13 681.7	1.164	1,u								4	21	<25
13 682.1	1.199	2,u								1	21	<25
13 682.2	1.197	0,u^-								1	21	<25
13 682.7	1.213	1,u								0	21	<25
13 682.9	1.202	1,g								1	20	<25
13 682.9	1.187	1,u								2	21	<25
13 684.1	1.186	1,g								2	21	<25
13 684.5	1.168	0,g^+	3	0	0	4	2	2	−2	3	21	38
13 684.8	1.173	2,g								3	21	<25
13 685.2	1.157	0,g^+	0	5	0	2	2	4	−2	5	21	32
		0,g^+	0	5	0	2	0	4	0	5	21	52
13 685.4	1.164	1,g								4	21	<25
13 685.6	1.160	1,u	1	1	2	0	0	3	1	4	21	47
13 685.8	1.186	1,u								2	21	<25
13 686.3	1.199	2,u								1	21	<25
13 686.3	1.171	0,g^-	0	0	3	1	−1	5	1	3	21	45
13 686.6	1.161	1,g								4	21	<25
13 686.7	1.174	2,g								3	21	<25
13 687.1	1.168	1,u	0	4	0	4	0	5	1	4	21	31
13 687.6	1.199	2,g								1	21	<25
13 687.9	1.187	1,g								2	21	<25
13 688.0	1.199	0,u^-								1	21	<25
13 688.7	1.185	1,u								2	21	<25
13 689.1	1.173	0,u^-	1	0	2	1	−1	5	1	3	21	37
13 689.4	1.199	0,g^-								1	21	<25
13 689.7	1.198	2,g								1	21	<25
13 691.1	1.186	1,u								2	21	<25
13 691.4	1.173	2,u								3	21	<25
13 691.7	1.193	2,u								2	20	<25
13 691.9	1.198	0,g^-								1	21	<25
13 692.8	1.198	0,u^-								1	21	<25
13 693.0	1.199	2,u								1	21	<25
13 693.7	1.188	1,g								2	21	<25
13 694.0	1.214	2,u								0	20	<25
13 694.0	1.198	2,g								1	21	<25
13 694.0	1.214	2,g								0	20	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 694.4	1.157	2,*g*	0	5	0	2	2	4	0	5	21	28
		2,*g*	0	5	0	2	0	4	2	5	21	52
13 694.6	1.199	0,u^+								1	21	<25
13 694.8	1.213	1,*g*								0	21	<25
13 694.8	1.170	0,u^+								3	21	<25
13 696.0	1.194	0,g^+	0	2	0	0	0	14	0	2	20	45
13 696.2	1.174	0,g^+								3	21	<25
13 697.0	1.187	1,*g*								2	21	<25
13 697.2	1.175	2,*u*								3	21	<25
13 697.3	1.199	0,g^+								1	21	<25
13 697.6	1.186	1,*u*								2	21	<25
13 697.6	1.199	0,u^+								1	21	<25
13 697.7	1.142	1,*g*	0	5	1	0	0	1	1	6	21	98
13 697.7	1.164	1,*g*								4	21	<25
13 698.2	1.176	0,u^-								3	21	<25
13 698.8	1.198	2,*u*								1	21	<25
13 699.0	1.174	0,g^+								3	21	<25
13 699.5	1.168	0,g^-	3	0	0	4	−2	2	2	3	21	52
13 699.8	1.163	1,*u*								4	21	<25
13 699.9	1.198	2,*g*								1	21	<25
13 699.9	1.213	1,*u*								0	21	<25
13 700.5	1.204	1,*u*	0	1	0	0	0	17	1	1	20	35
13 700.7	1.200	0,u^-								1	21	<25
13 700.8	1.175	0,u^+								3	21	<25
13 701.1	1.171	2,*g*	0	0	3	1	−1	5	3	3	21	27
13 701.4	1.187	1,*u*								2	21	<25
13 701.4	1.213	1,*g*								0	21	<25
13 701.6	1.173	2,*u*								3	21	<25
13 702.2	1.161	1,*g*	2	2	0	3	−1	2	2	4	21	26
13 702.2	1.199	2,*u*								1	21	<25
13 702.4	1.200	0,u^+								1	21	<25
13 702.4	1.200	0,g^-								1	21	<25
13 703.3	1.474	0,u^+	1	1	1	4	0	4	0	3	21	25
13 703.9	1.174	0,g^+								3	21	<25
13 704.3	1.200	2,*g*								1	21	<25
13 704.3	1.201	0,g^+								1	21	<25
13 705.0	1.172	2,*g*								3	21	<25
13 705.7	1.187	1,*u*								2	21	<25
13 706.0	1.201	1,*u*								1	20	<25
13 706.2	1.201	1,*g*								1	20	<25
13 706.9	1.187	1,*g*								2	21	<25
13 706.9	1.213	1,*u*	0	0	0	10	−10	11	11	0	21	33
13 707.2	1.174	2,*g*								3	21	<25
13 707.3	1.173	2,*u*								3	21	<25
13 707.7	1.187	1,*u*								2	21	<25
13 707.8	1.200	2,*u*								1	21	<25
13 707.9	1.201	0,u^+								1	21	<25
13 708.0	1.187	1,*g*								2	21	<25
13 708.2	1.194	2,*g*	0	2	0	0	0	14	2	2	20	47
13 708.5	1.175	2,*u*								3	21	<25
13 708.5	1.199	0,g^-								1	21	<25
13 709.6	1.200	2,*g*								1	21	<25
13 711.3	1.187	1,*u*								2	21	<25
13 711.6	1.170	2,*u*								3	21	<25
13 712.7	1.199	2,*g*								1	21	<25
13 712.9	1.172	2,*g*								3	21	<25
13 713.3	1.186	1,*g*								2	21	<25
13 713.3	1.175	0,g^-	2	1	0	4	−4	4	4	3	21	28
13 713.6	1.213	1,*g*								0	21	<25
13 713.7	1.213	1,*u*								0	21	<25
13 713.8	1.164	1,*g*	1	3	0	3	−3	4	4	4	21	34
13 713.9	1.146	0,u^+	2	2	1	0	0	0	0	5	21	54
		0,u^+	0	2	3	0	0	0	0	5	21	31
13 714.0	1.165	1,*u*	0	3	1	3	1	4	0	4	21	31

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		1,u	0	3	1	3	−1	4	2	4	21	32
13 715.1	1.186	1,u								2	21	<25
13 715.6	1.158	1,u	1	1	2	0	0	3	1	4	21	25
13 715.6	1.174	0,g^+	1	1	1	3	3	5	−3	3	21	25
13 716.3	1.186	1,g								2	21	<25
13 716.6	1.176	2,u								3	21	<25
13 717.1	1.200	0,g^+								1	21	<25
13 717.5	1.173	2,g								3	21	<25
13 717.7	1.214	0,g^-								0	20	<25
13 717.8	1.214	0,u^+								0	20	<25
13 718.1	1.160	1,g	2	2	0	3	1	2	0	4	21	34
13 718.2	1.213	1,g								0	21	<25
13 718.3	1.153	0,g^+	0	4	1	1	1	3	−1	5	21	64
13 719.3	1.186	1,u								2	21	<25
13 719.3	1.200	2,u								1	21	<25
13 719.8	1.200	2,g								1	21	<25
13 720.1	1.200	2,u								1	21	<25
13 720.5	1.172	0,u^-								3	21	<25
13 721.9	1.153	1,g	3	0	1	0	0	1	1	4	21	70
13 722.1	1.174	0,g^-	2	1	0	4	−4	4	4	3	21	29
13 722.3	1.213	1,u	0	0	0	10	−10	11	11	0	21	30
13 723.5	1.187	1,u								2	21	<25
13 723.5	1.199	0,u^-								1	21	<25
13 724.0	1.199	0,g^+								1	21	<25
13 724.8	1.187	1,g								2	21	<25
13 724.9	1.164	1,g								4	21	<25
13 725.1	1.175	2,g								3	21	<25
13 725.5	1.175	0,g^+								3	21	<25
13 725.8	1.186	1,u								2	21	<25
13 726.2	1.200	2,u								1	21	<25
13 726.2	1.200	0,u^+								1	21	<25
13 726.5	1.170	0,u^-								3	21	<25
13 726.9	1.199	2,g								1	21	<25
13 727.0	1.167	0,g^+	3	0	0	4	0	2	0	3	21	44
13 727.3	1.175	0,u^-	0	2	1	4	−4	6	4	3	21	25
13 727.4	1.214	2,g								0	20	<25
13 727.4	1.214	2,u								0	20	<25
13 729.2	1.186	1,g								2	21	<25
13 730.2	1.199	2,u								1	21	<25
13 730.2	1.199	0,g^+								1	21	<25
13 730.6	1.176	2,g								3	21	<25
13 731.4	1.175	0,u^+								3	21	<25
13 731.4	1.176	0,g^-								3	21	<25
13 732.5	1.199	2,u								1	21	<25
13 732.9	1.157	1,u	2	1	1	1	−1	2	2	4	21	30
13 732.9	1.186	1,u								2	21	<25
13 733.2	1.169	1,u								3	22	<25
13 733.3	1.169	1,g								3	22	<25
13 733.3	1.175	0,u^+								3	21	<25
13 733.4	1.153	2,g	0	4	1	1	1	3	1	5	21	26
		2,g	0	4	1	1	−1	3	3	5	21	37
13 733.4	1.185	1,g								2	21	<25
13 733.6	1.199	2,g								1	21	<25
13 734.1	1.171	2,u								3	21	<25
13 735.0	1.214	1,u								0	21	<25
13 735.3	1.200	0,g^-								1	21	<25
13 735.9	1.200	0,g^+								1	21	<25
13 735.9	1.174	0,u^-	0	1	2	3	−1	5	1	3	21	26
13 736.1	1.200	2,g								1	21	<25
13 736.3	1.174	0,g^+								3	21	<25
13 736.6	1.201	0,u^-								1	21	<25
13 736.7	1.168	2,g	3	0	0	4	0	2	2	3	21	37
13 737.4	1.173	2,u								3	21	<25
13 738.2	1.165	1,g								4	21	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 738.5	1.199	2,*u*								1	21	<25
13 738.6	1.187	1,*u*								2	21	<25
13 740.7	1.185	1,*g*								2	21	<25
13 740.7	1.214	1,*g*								0	21	<25
13 741.4	1.175	2,*g*								3	21	<25
13 741.7	1.175	2,*u*								3	21	<25
13 741.9	1.198	0,u^+								1	21	<25
13 742.3	1.175	2,*u*								3	21	<25
13 742.8	1.200	2,*g*								1	21	<25
13 742.8	1.201	2,*u*								1	21	<25
13 743.1	1.176	2,*g*								3	21	<25
13 743.3	1.142	1,*u*	1	5	0	0	0	1	1	6	21	76
13 743.5	1.152	0,u^+	1	4	0	1	1	3	−1	5	21	38
13 744.5	1.185	1,*g*								2	21	<25
13 744.7	1.202	0,g^-								1	21	<25
13 745.2	1.200	0,u^+								1	21	<25
13 745.3	1.202	1,*u*								1	20	<25
13 745.4	1.202	1,*g*								1	20	<25
13 745.9	1.162	1,*u*								4	21	<25
13 746.2	1.186	1,*u*								2	21	<25
13 747.3	1.174	2,*u*								3	21	<25
13 747.4	1.200	2,*g*								1	21	<25
13 747.7	1.188	1,*u*								2	21	<25
13 747.7	1.166	1,*g*								4	21	<25
13 748.2	1.175	2,*u*								3	21	<25
13 748.2	1.201	0,u^-								1	21	<25
13 748.5	1.199	0,g^+								1	21	<25
13 748.8	1.186	1,*g*								2	21	<25
13 749.4	1.215	1,*u*								0	21	<25
13 750.0	1.174	2,*g*								3	21	<25
13 750.4	1.200	0,u^+								1	21	<25
13 750.4	1.179	0,g^+								3	21	<25
13 750.6	1.200	2,*g*								1	21	<25
13 750.7	1.215	1,*g*								0	21	<25
13 750.7	1.155	1,*g*	0	5	0	7	1	0	0	5	22	90
13 750.9	1.187	1,*g*								2	21	<25
13 751.1	1.200	0,u^-	0	0	1	6	−6	10	6	1	21	25
13 751.8	1.154	0,g^-	0	4	1	1	−1	3	1	5	21	94
13 751.9	1.200	0,g^-								1	21	<25
13 752.4	1.199	2,*u*								1	21	<25
13 752.5	1.176	0,g^-	1	2	0	4	−4	6	4	3	21	50
13 753.1	1.188	1,*g*								2	21	<25
13 754.0	1.201	1,*g*								1	20	<25
13 754.0	1.174	0,g^+								3	21	<25
13 754.6	1.199	0,g^+								1	21	<25
13 754.8	1.202	1,*u*								1	20	<25
13 754.9	1.157	1,*u*	3	1	0	2	2	1	−1	4	21	43
13 755.3	1.165	1,*g*	1	3	0	3	1	4	0	4	21	27
13 755.9	1.175	0,u^+	0	2	1	4	4	6	−4	3	21	33
13 756.0	1.199	2,*u*								1	21	<25
13 756.5	1.200	2,*g*								1	21	<25
13 757.7	1.186	1,*u*								2	21	<25
13 758.2	1.201	2,*u*								1	21	<25
13 758.2	1.188	1,*g*								2	21	<25
13 758.2	1.169	0,u^+	3	0	0	3	3	3	−3	3	21	51
13 758.6	1.188	1,*u*								2	21	<25
13 759.4	1.152	2,*u*								5	21	<25
13 759.8	1.179	2,*g*								3	21	<25
13 761.2	1.213	1,*u*								0	21	<25
13 761.4	1.178	0,u^+								3	21	<25
13 762.6	1.199	2,*g*								1	21	<25
13 762.7	1.154	2,*g*	0	4	1	1	1	3	1	5	21	65
13 762.8	1.187	1,*g*								2	21	<25
13 762.9	1.199	0,u^+								1	21	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 764.5	1.175	2,g								3	21	<25
13 764.5	1.198	0,u^+								1	21	<25
13 765.1	1.189	1,u								2	21	<25
13 765.6	1.156	1,u	3	1	0	2	0	1	1	4	21	66
13 765.7	1.199	2,u								1	21	<25
13 766.2	1.152	0,g^+	0	3	2	0	0	2	0	5	21	64
		0,g^+	0	4	1	1	1	3	−1	5	21	26
13 767.0	1.176	2,g								3	21	<25
13 767.0	1.188	1,u								2	21	<25
13 767.0	1.168	0,u^-	3	0	0	3	−3	3	3	3	21	62
13 767.3	1.149	0,u^-	2	3	0	1	−1	1	1	5	21	74
13 767.4	1.199	2,g								1	21	<25
13 767.4	1.214	0,u^-	0	0	0	1	−1	19	1	0	20	26
13 767.5	1.188	1,g								2	21	<25
13 767.7	1.173	0,g^-	2	1	0	4	−2	4	2	3	21	33
13 767.9	1.214	0,g^+								0	20	<25
13 768.1	1.176	2,u								3	21	<25
13 768.6	1.170	0,u^+	2	0	1	2	2	4	−2	3	21	25
13 768.6	1.152	0,u^+	2	3	0	1	1	1	−1	5	21	50
		0,u^+	0	5	0	1	1	5	−1	5	21	29
13 769.3	1.177	0,g^+								3	21	<25
13 770.0	1.199	0,u^-								1	21	<25
13 771.1	1.178	2,u								3	21	<25
13 771.5	1.145	1,u	0	6	0	0	0	3	1	6	21	76
13 771.8	1.200	0,g^+								1	21	<25
13 772.0	1.184	0,u^+								2	22	<25
13 772.0	1.184	0,g^+								2	22	<25
13 772.1	1.199	0,g^-								1	21	<25
13 772.3	1.200	2,u								1	21	<25
13 773.2	1.176	0,g^-	0	1	2	2	−2	6	2	3	21	29
13 773.8	1.213	1,g								0	21	<25
13 774.9	1.164	1,g								4	21	<25
13 774.9	1.200	2,u								1	21	<25
13 775.6	1.188	1,u								2	21	<25
13 776.3	1.187	1,g								2	21	<25
13 776.3	1.175	2,g								3	21	<25
13 776.4	1.170	2,u	3	0	0	3	3	3	−1	3	21	28
13 776.9	1.214	2,u								0	20	<25
13 777.1	1.172	0,g^+	1	0	2	0	0	6	0	3	21	43
		0,g^+	0	0	3	1	1	5	−1	3	21	25
13 777.4	1.214	2,g								0	20	<25
13 777.8	1.187	1,g								2	21	<25
13 778.1	1.200	2,g								1	21	<25
13 780.3	1.175	2,g								3	21	<25
13 780.5	1.171	0,u^+	0	0	3	0	0	6	0	3	21	49
13 780.9	1.199	2,u								1	21	<25
13 781.1	1.184	2,u								2	22	<25
13 781.1	1.184	2,g								2	22	<25
13 781.5	1.169	2,u								3	21	<25
13 782.0	1.152	2,g	0	3	2	0	0	2	2	5	21	58
		2,g	0	4	1	1	−1	3	3	5	21	30
13 782.1	1.201	2,g								1	21	<25
13 782.2	1.200	0,u^+								1	21	<25
13 782.3	1.201	0,g^-								1	21	<25
13 782.6	1.152	2,u	2	3	0	1	1	1	1	5	21	49
13 782.8	1.199	0,g^+								1	21	<25
13 783.3	1.213	1,u								0	21	<25
13 783.4	1.186	1,g								2	21	<25
13 783.7	1.202	0,u^-								1	21	<25
13 784.0	1.214	1,g								0	21	<25
13 784.1	1.162	0,g^+	0	4	0	10	0	0	0	4	22	36
13 784.2	1.189	1,u								2	21	<25
13 786.3	1.201	2,g								1	21	<25
13 786.8	1.152	0,u^+	1	3	1	0	0	2	0	5	21	61

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,u^+$	0	5	0	1	1	5	−1	5	21	27
13 787.1	1.200	$2,u$								1	21	<25
13 787.1	1.178	$0,u^+$								3	21	<25
13 787.6	1.175	$0,u^-$								3	21	<25
13 788.3	1.187	$1,g$								2	21	<25
13 789.0	1.151	$1,g$	4	0	0	1	1	0	0	4	21	86
13 789.2	1.175	$2,g$								3	21	<25
13 789.2	1.199	$0,g^+$								1	21	<25
13 789.2	1.157	$0,u^+$	1	0	3	2	0	0	0	4	22	40
13 789.7	1.163	$2,g$	0	4	0	10	2	0	0	4	22	45
13 789.7	1.166	$1,u$								4	21	<25
13 791.2	1.162	$1,u$								4	21	<25
13 791.5	1.157	$0,g^+$	2	0	2	2	0	0	0	4	22	40
13 791.9	1.213	$1,u$								0	21	<25
13 792.6	1.172	$2,g$	1	0	2	0	0	6	2	3	21	43
13 792.7	1.187	$1,u$								2	21	<25
13 793.0	1.175	$0,u^-$	1	2	0	5	−1	5	1	3	21	30
13 793.2	1.178	$0,g^+$	1	2	0	4	4	6	−4	3	21	29
13 793.4	1.198	$2,g$								1	21	<25
13 793.4	1.200	$0,u^-$								1	21	<25
13 793.4	1.200	$0,g^-$								1	21	<25
13 793.5	1.188	$1,g$								2	21	<25
13 793.8	1.164	$1,g$								4	21	<25
13 794.7	1.169	$0,u^+$	3	0	0	3	1	3	−1	3	21	32
13 794.7	1.174	$0,g^-$	1	1	1	3	−1	5	1	3	21	37
13 795.2	1.201	$2,g$								1	21	<25
13 795.8	1.186	$1,u$								2	21	<25
13 796.0	1.187	$1,g$								2	21	<25
13 796.3	1.172	$2,u$	0	0	3	0	0	6	2	3	21	35
13 796.7	1.158	$2,u$	1	0	3	2	2	0	0	4	22	38
13 797.0	1.153	$2,u$	1	3	1	0	0	2	2	5	21	42
13 797.1	1.202	$1,g$								1	20	<25
13 797.2	1.154	$0,u^-$	1	4	0	1	−1	3	1	5	21	62
13 797.9	1.187	$1,u$								2	21	<25
13 797.9	1.202	$1,u$								1	20	<25
13 798.2	1.156	$2,g$	2	0	2	2	2	0	0	4	22	48
		$2,g$	0	0	4	2	2	0	0	4	22	27
13 798.6	1.201	$2,u$								1	21	<25
13 798.6	1.187	$1,u$								2	21	<25
13 798.6	1.201	$0,g^+$								1	21	<25
13 798.7	1.213	$1,g$								0	21	<25
13 798.8	1.162	$0,u^+$	0	4	0	9	1	1	−1	4	22	33
13 798.9	1.176	$0,u^-$	0	2	1	4	−2	6	2	3	21	28
13 799.2	1.173	$2,u$								3	21	<25
13 801.1	1.187	$1,g$								2	21	<25
13 801.3	1.175	$2,g$								3	21	<25
13 801.5	1.175	$2,u$								3	21	<25
13 802.1	1.201	$0,u^+$								1	21	<25
13 802.5	1.178	$2,u$								3	21	<25
13 803.9	1.161	$2,u$								4	22	<25
13 804.6	1.177	$0,g^+$	0	2	1	3	1	7	−1	3	21	33
13 804.7	1.200	$2,g$								1	21	<25
13 804.7	1.186	$1,u$								2	21	<25
13 805.1	1.154	$0,u^+$	1	4	0	1	1	3	−1	5	21	50
		$0,u^+$	0	5	0	1	1	5	−1	5	21	26
13 805.2	1.178	$2,g$								3	21	<25
13 805.7	1.215	$1,g$								0	21	<25
13 805.7	1.169	$1,g$	0	4	0	3	1	6	0	4	21	34
		$1,g$	0	4	0	3	−1	6	2	4	21	27
13 806.1	1.161	$1,u$								4	21	<25
13 806.1	1.202	$0,u^+$								1	21	<25
13 806.3	1.200	$2,u$								1	21	<25
13 806.4	1.187	$1,g$								2	21	<25
13 807.4	1.216	$1,u$								0	21	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 807.8	1.187	1,u								2	21	<25
13 807.8	1.201	0,g^+								1	21	<25
13 808.0	1.171	2,u	3	0	0	3	−1	3	3	3	21	25
13 808.6	1.173	0,u^+	2	1	0	3	1	5	−1	3	21	29
13 808.9	1.199	0,u^-								1	21	<25
13 809.1	1.200	0,g^-								1	21	<25
13 810.1	1.189	1,g								2	21	<25
13 810.2	1.201	2,u								1	21	<25
13 810.4	1.175	2,u								3	21	<25
13 810.5	1.170	0,g^+	2	0	1	1	1	5	−1	3	21	30
		0,g^+	1	0	2	0	0	6	0	3	21	25
13 810.9	1.186	1,u								2	21	<25
13 811.0	1.145	0,g^+	0	6	0	4	0	0	0	6	22	98
13 811.3	1.154	2,u	1	4	0	1	1	3	1	5	21	36
		2,u	0	5	0	1	−1	5	3	5	21	26
13 811.6	1.200	2,g								1	21	<25
13 812.0	1.186	1,g								2	21	<25
13 813.2	1.214	1,g								0	21	<25
13 814.4	1.145	2,g	0	6	0	4	2	0	0	6	22	99
13 815.0	1.200	0,u^-								1	21	<25
13 815.1	1.165	1,g	0	3	1	2	2	5	−1	4	21	26
13 815.3	1.198	0,g^-								1	21	<25
13 815.4	1.198	2,u								1	21	<25
13 815.7	1.198	0,u^-								1	21	<25
13 816.2	1.212	1,u								0	21	<25
13 816.3	1.156	1,u	0	5	0	6	2	1	−1	5	22	51
		1,u	0	5	0	6	0	1	1	5	22	32
13 816.5	1.201	2,u								1	21	<25
13 816.9	1.173	1,u								3	22	<25
13 816.9	1.200	0,u^+								1	21	<25
13 817.6	1.173	1,g								3	22	<25
13 818.0	1.153	2,u	1	3	1	0	0	2	2	5	21	27
		2,u	1	4	0	1	−1	3	3	5	21	33
13 818.0	1.201	2,g								1	21	<25
13 818.7	1.172	0,g^+	2	1	0	4	0	4	0	3	21	30
13 819.0	1.200	2,u								1	21	<25
13 819.7	1.177	2,g								3	21	<25
13 819.8	1.199	2,g								1	21	<25
13 821.2	1.167	0,u^-	3	0	0	3	−1	3	1	3	21	68
13 821.3	1.162	1,u	2	2	0	2	−2	3	3	4	21	30
13 821.4	1.187	1,g								2	21	<25
13 822.0	1.187	1,u								2	21	<25
13 822.7	1.200	2,g								1	21	<25
13 823.9	1.202	0,g^+								1	21	<25
13 824.4	1.173	2,u								3	21	<25
13 824.4	1.200	0,g^-								1	21	<25
13 824.5	1.176	0,g^-	1	2	0	4	−2	6	2	3	21	29
13 824.8	1.213	1,u								0	21	<25
13 826.0	1.213	1,g								0	21	<25
13 826.0	1.171	2,g								3	21	<25
13 827.5	1.200	2,u								1	21	<25
13 828.2	1.176	0,g^+								3	21	<25
13 828.6	1.170	1,u								3	22	<25
13 828.7	1.177	0,u^+								3	21	<25
13 829.0	1.170	1,g	1	0	2	7	1	0	0	3	22	25
13 829.5	1.172	2,g	2	1	0	4	0	4	2	3	21	26
13 830.3	1.200	2,g								1	21	<25
13 830.9	1.186	1,g								2	21	<25
13 831.0	1.201	2,u								1	21	<25
13 831.9	1.166	1,g	0	3	1	2	0	5	1	4	21	45
13 832.1	1.188	1,g								2	21	<25
13 832.4	1.168	2,u	3	0	0	3	1	3	1	3	21	42
13 832.9	1.166	1,u								4	21	<25
13 833.5	1.162	1,u	2	2	0	2	0	3	1	4	21	44

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 834.1	1.176	2,*g*								3	21	<25
13 834.2	1.157	0,u^-	0	5	0	1	−1	5	1	5	21	75
13 834.5	1.199	0,u^+								1	21	<25
13 835.0	1.163	0,g^+								4	22	<25
13 836.2	1.202	0,g^+								1	21	<25
13 837.2	1.173	0,u^-	2	1	0	3	−3	5	3	3	21	53
13 837.3	1.165	1,*u*	1	2	1	1	−1	4	2	4	21	27
13 837.5	1.170	1,*g*								3	22	<25
13 837.9	1.170	1,*u*								3	22	<25
13 839.0	1.188	1,*u*								2	21	<25
13 839.2	1.200	2,*u*								1	21	<25
13 839.5	1.177	2,*u*								3	21	<25
13 839.6	1.164	2,*g*								4	22	<25
13 840.7	1.176	2,*g*								3	21	<25
13 840.8	1.201	2,*g*								1	21	<25
13 840.8	1.214	0,u^-								0	20	<25
13 840.8	1.214	0,g^+								0	20	<25
13 841.2	1.189	1,*g*								2	21	<25
13 841.4	1.158	1,*g*	2	1	1	0	0	3	1	4	21	32
13 841.4	1.177	0,u^+	1	2	0	3	1	7	−1	3	21	37
13 841.9	1.201	0,g^-								1	21	<25
13 842.1	1.177	0,g^-	0	2	1	3	−3	7	3	3	21	47
13 842.2	1.214	2,*u*								0	20	<25
13 842.2	1.214	2,*g*								0	20	<25
13 843.2	1.187	1,*u*								2	21	<25
13 843.2	1.201	0,u^+								1	21	<25
13 843.9	1.214	1,*g*								0	21	<25
13 844.0	1.189	1,*u*								2	21	<25
13 844.0	1.199	0,g^+								1	21	<25
13 844.3	1.190	1,*g*								2	21	<25
13 844.7	1.157	2,*u*	0	5	0	1	1	5	1	5	21	46
		2,*u*	0	5	0	1	−1	5	3	5	21	32
13 844.9	1.214	1,*u*								0	21	<25
13 846.2	1.201	0,u^-								1	21	<25
13 847.5	1.179	0,u^-								3	21	<25
13 848.4	1.186	1,*u*								2	21	<25
13 848.6	1.201	2,*u*								1	21	<25
13 849.1	1.188	1,*g*								2	21	<25
13 849.4	1.199	2,*g*								1	21	<25
13 849.6	1.200	1,*u*								1	22	<25
13 849.6	1.200	1,*g*								1	22	<25
13 849.9	1.173	2,*u*	2	1	0	3	−3	5	5	3	21	43
13 851.5	1.170	0,g^-	3	0	0	2	−2	4	2	3	21	27
		0,g^-	2	0	1	1	−1	5	1	3	21	34
13 851.9	1.201	2,*g*								1	21	<25
13 852.9	1.201	0,u^+								1	21	<25
13 853.0	1.179	0,u^-								3	21	<25
13 853.4	1.188	1,*u*								2	21	<25
13 854.4	1.189	1,*u*								2	21	<25
13 854.6	1.201	2,*g*								1	21	<25
13 855.2	1.185	0,u^-								2	22	<25
13 855.2	1.185	0,g^-								2	22	<25
13 855.4	1.174	0,u^+								3	21	<25
13 856.0	1.177	2,*g*	0	2	1	3	−3	7	5	3	21	26
13 856.3	1.177	2,*u*								3	21	<25
13 856.7	1.200	0,u^-								1	21	<25
13 857.5	1.179	2,*u*								3	21	<25
13 857.7	1.212	1,*g*								0	21	<25
13 857.7	1.144	0,g^+	3	2	0	0	0	0	0	5	21	88
13 858.0	1.160	0,u^+								4	22	<25
13 858.2	1.212	1,*u*								0	21	<25
13 858.3	1.180	0,g^-								3	21	<25
13 858.6	1.202	2,*u*								1	21	<25
13 859.2	1.175	0,g^+	1	1	1	1	1	7	−1	3	21	26

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 860.3	1.214	1,g								0	21	<25
13 861.9	1.161	2,u								4	22	<25
13 862.1	1.176	0,u^+	0	1	2	1	1	7	−1	3	21	33
13 862.7	1.200	0,g^+								1	21	<25
13 862.9	1.156	1,u	0	5	0	6	2	1	−1	5	22	37
		1,u	0	5	0	6	0	1	1	5	22	55
13 862.9	1.185	2,g								2	22	<25
13 863.0	1.185	2,u								2	22	<25
13 863.3	1.200	2,u								1	21	<25
13 863.9	1.214	1,u								0	21	<25
13 864.1	1.178	2,u								3	21	<25
13 864.7	1.214	0,u^+								0	20	<25
13 864.7	1.214	0,g^-								0	20	<25
13 864.8	1.189	1,g								2	21	<25
13 865.0	1.170	2,g								3	21	<25
13 865.1	1.200	2,g								1	21	<25
13 866.0	1.188	1,u								2	21	<25
13 866.7	1.200	0,g^-								1	21	<25
13 867.1	1.162	0,g^+								4	22	<25
13 867.4	1.166	0,u^-	0	4	0	9	−1	1	1	4	22	63
13 867.5	1.167	1,u	1	3	0	2	−2	5	3	4	21	27
		1,u	0	4	0	2	2	7	−1	4	21	27
13 867.6	1.187	1,u								2	21	<25
13 867.7	1.201	2,u								1	21	<25
13 867.8	1.179	2,g								3	21	<25
13 867.8	1.175	2,u								3	21	<25
13 868.2	1.184	0,u^+								2	22	<25
13 868.2	1.184	0,g^+								2	22	<25
13 868.8	1.200	0,g^+								1	21	<25
13 870.3	1.162	2,g	1	1	2	4	2	0	0	4	22	26
13 871.3	1.170	0,g^+	3	0	0	2	2	4	−2	3	21	34
13 872.2	1.188	1,u								2	21	<25
13 872.5	1.187	1,g								2	21	<25
13 872.5	1.201	0,u^+								1	21	<25
13 873.3	1.165	2,u	0	4	0	9	1	1	1	4	22	44
13 874.8	1.175	2,g								3	21	<25
13 875.3	1.165	1,u	1	3	0	2	0	5	1	4	21	26
13 875.3	1.199	2,g								1	21	<25
13 875.7	1.214	2,g								0	20	<25
13 875.7	1.214	2,u								0	20	<25
13 876.2	1.200	0,u^+								1	21	<25
13 876.8	1.200	2,g								1	21	<25
13 877.0	1.188	1,g								2	21	<25
13 877.2	1.184	2,u								2	22	<25
13 877.2	1.184	2,g								2	22	<25
13 877.4	1.201	2,u								1	21	<25
13 877.6	1.176	2,u								3	21	<25
13 877.8	1.157	1,g	3	1	0	1	−1	2	2	4	21	60
13 878.3	1.203	0,g^-								1	21	<25
13 878.6	1.186	1,g								2	21	<25
13 879.4	1.187	1,u								2	21	<25
13 880.5	1.203	0,u^-								1	21	<25
13 882.3	1.156	1,g	3	1	0	1	1	2	0	4	21	64
13 882.6	1.187	1,u								2	21	<25
13 883.1	1.187	1,g								2	21	<25
13 883.2	1.214	1,g								0	21	<25
13 883.3	1.177	0,g^+	0	2	1	3	3	7	−3	3	21	28
13 883.9	1.215	1,u								0	21	<25
13 883.9	1.200	0,u^+								1	21	<25
13 884.0	1.198	0,g^+	0	1	0	18	0	0	0	1	21	25
13 884.1	1.174	0,u^+	1	1	1	2	0	6	0	3	21	30
13 884.9	1.199	2,u								1	21	<25
13 885.8	1.169	2,g	3	0	0	2	−2	4	4	3	21	33
13 886.8	1.213	1,g								0	21	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 886.8	1.179	$0,u^-$	1	2	0	3	−3	7	3	3	21	41
		$0,u^-$	0	3	0	3	−3	9	3	3	21	27
13 887.5	1.165	$1,u$	0	2	2	0	0	5	1	4	21	28
13 888.4	1.173	$1,u$								3	22	<25
13 888.7	1.200	$2,g$								1	21	<25
13 888.8	1.177	$0,g^+$								3	21	<25
13 889.3	1.169	$0,g^-$	3	0	0	2	−2	4	2	3	21	57
13 890.1	1.173	$1,g$								3	22	<25
13 890.3	1.164	$0,u^+$	0	3	1	8	0	0	0	4	22	33
13 890.4	1.203	$2,g$								1	21	<25
13 890.4	1.166	$0,g^-$	0	4	0	8	−2	2	2	4	22	55
13 891.6	1.188	$1,u$								2	21	<25
13 892.3	1.202	$2,u$								1	21	<25
13 892.5	1.213	$1,u$								0	21	<25
13 892.5	1.174	$2,u$	1	1	1	2	0	6	2	3	21	29
13 892.9	1.188	$1,g$								2	21	<25
13 893.9	1.200	$0,g^-$								1	21	<25
13 894.5	1.200	$0,u^-$								1	21	<25
13 895.0	1.164	$2,u$	0	3	1	8	2	0	0	4	22	32
13 895.0	1.176	$2,g$								3	21	<25
13 895.6	1.201	$0,g^+$								1	21	<25
13 896.7	1.166	$2,g$	0	4	0	8	0	2	2	4	22	29
13 897.2	1.164	$1,g$								4	21	<25
13 897.9	1.187	$1,u$								2	21	<25
13 897.9	1.155	$0,u^+$	0	4	1	0	0	4	0	5	21	94
13 898.0	1.176	$2,g$								3	21	<25
13 898.0	1.188	$1,g$								2	21	<25
13 898.1	1.201	$2,g$								1	21	<25
13 899.8	1.215	$1,g$								0	21	<25
13 899.9	1.201	$2,u$								1	21	<25
13 899.9	1.178	$2,u$								3	21	<25
13 900.7	1.174	$1,g$								3	22	<25
13 901.2	1.174	$1,u$								3	22	<25
13 901.5	1.201	$2,g$								1	21	<25
13 901.6	1.156	$1,g$	0	5	0	5	3	2	−2	5	22	36
		$1,g$	0	5	0	5	1	2	0	5	22	29
13 902.4	1.200	$2,u$								1	21	<25
13 902.4	1.170	$2,g$								3	21	<25
13 902.5	1.201	$0,g^+$								1	21	<25
13 902.5	1.187	$0,u^+$								2	22	<25
13 902.5	1.187	$0,g^+$								2	22	<25
13 903.7	1.188	$1,g$								2	21	<25
13 903.9	1.203	$0,u^+$								1	21	<25
13 905.6	1.189	$1,u$								2	21	<25
13 906.1	1.163	$0,u^+$								4	22	<25
13 907.7	1.200	$0,u^-$								1	21	<25
13 908.1	1.163	$2,u$								4	22	<25
13 908.3	1.214	$0,u^-$								0	20	<25
13 908.3	1.214	$0,g^+$								0	20	<25
13 908.4	1.216	$1,u$								0	21	<25
13 909.3	1.174	$1,g$								3	22	<25
13 910.1	1.187	$2,g$								2	22	<25
13 910.1	1.187	$2,u$								2	22	<25
13 910.1	1.151	$0,g^+$	2	3	0	0	0	2	0	5	21	58
		$0,g^+$	1	4	0	0	0	4	0	5	21	27
13 910.3	1.174	$1,u$								3	22	<25
13 911.8	1.155	$2,u$	0	4	1	0	0	4	2	5	21	94
13 912.1	1.177	$0,u^+$	1	2	0	3	3	7	−3	3	21	31
13 912.7	1.200	$2,g$								1	21	<25
13 913.0	1.173	$0,u^-$	2	1	0	3	−1	5	1	3	21	51
13 914.2	1.171	$1,g$								3	22	<25
13 914.4	1.201	$0,g^-$								1	21	<25
13 914.8	1.190	$1,g$								2	21	<25
13 914.8	1.202	$2,u$								1	21	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 915.0	1.189	1,u								2	21	<25
13 915.7	1.213	1,u								0	21	<25
13 915.9	1.152	1,u	4	0	0	0	0	1	1	4	21	89
13 916.1	1.168	0,g^+	3	0	0	2	2	4	−2	3	21	27
		0,g^+	3	0	0	2	0	4	0	3	21	49
13 917.0	1.179	0,g^+								3	21	<25
13 917.2	1.171	1,u								3	22	<25
13 917.2	1.176	0,u^-	0	1	2	1	−1	7	1	3	21	48
13 917.5	1.214	2,u								0	20	<25
13 917.5	1.214	2,g								0	20	<25
13 917.6	1.190	1,u								2	21	<25
13 917.7	1.157	0,g^+	1	0	3	1	1	1	−1	4	22	34
13 918.0	1.203	0,g^+								1	21	<25
13 918.1	1.178	0,u^+	0	2	1	2	2	8	−2	3	21	31
13 918.4	1.156	0,u^+	2	0	2	1	1	1	−1	4	22	41
		0,u^+	0	0	4	1	1	1	−1	4	22	26
13 918.7	1.153	1,u	0	4	1	5	1	0	0	5	22	81
13 919.5	1.190	1,g								2	21	<25
13 919.7	1.203	1,g								1	20	<25
13 919.7	1.203	1,u								1	20	<25
13 921.0	1.201	2,u								1	21	<25
13 921.8	1.189	1,u								2	21	<25
13 922.4	1.159	0,g^+								4	22	<25
13 922.5	1.177	0,g^-								3	21	<25
13 923.3	1.200	1,u								1	22	<25
13 923.3	1.200	1,g								1	22	<25
13 923.3	1.177	2,u								3	21	<25
13 923.7	1.161	2,g								4	22	<25
13 924.4	1.169	1,u	0	4	0	2	0	7	1	4	21	37
13 924.5	1.173	2,u								3	21	<25
13 924.5	1.216	0,u^+								0	22	<25
13 924.5	1.216	0,g^+								0	22	<25
13 924.6	1.156	0,u^-	2	0	2	1	−1	1	1	4	22	51
		0,u^-	0	0	4	1	−1	1	1	4	22	31
13 925.1	1.150	2,g	2	3	0	0	0	2	2	5	21	65
13 925.5	1.189	1,g								2	21	<25
13 926.1	1.174	0,g^+	2	1	0	2	2	6	−2	3	21	26
		0,g^+	1	1	1	1	1	7	−1	3	21	32
13 926.4	1.201	0,u^+								1	21	<25
13 926.5	1.187	1,g								2	21	<25
13 926.7	1.201	0,u^-								1	21	<25
13 927.1	1.201	2,g								1	21	<25
13 927.7	1.156	0,g^-	1	0	3	1	−1	1	1	4	22	69
13 927.8	1.165	1,u	0	2	2	0	0	5	1	4	21	43
13 928.1	1.202	2,u								1	21	<25
13 928.1	1.169	2,g	3	0	0	2	0	4	2	3	21	47
13 928.3	1.215	1,g								0	21	<25
13 929.6	1.189	1,u								2	21	<25
13 930.2	1.171	1,u								3	22	<25
13 930.3	1.202	0,g^+								1	21	<25
13 930.4	1.171	1,g								3	22	<25
13 930.8	1.176	2,u								3	21	<25
13 931.0	1.171	0,u^+	2	0	1	0	0	6	0	3	21	38
13 931.2	1.212	1,u								0	21	<25
13 931.5	1.179	2,g								3	21	<25
13 931.5	1.201	0,g^-								1	21	<25
13 931.6	1.216	1,u								0	21	<25
13 931.9	1.157	2,u	2	0	2	1	1	1	1	4	22	39
13 932.6	1.178	2,u								3	21	<25
13 934.0	1.156	2,g	1	0	3	1	1	1	1	4	22	54
13 934.1	1.202	0,u^-								1	21	<25
13 934.2	1.203	2,g								1	21	<25
13 934.2	1.177	2,g								3	21	<25
13 934.5	1.213	1,g								0	21	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 935.5	1.173	1,*g*								3	22	<25
13 935.8	1.202	2,*u*								1	21	<25
13 936.1	1.165	0,u^-	0	4	0	7	−3	3	3	4	22	38
13 937.7	1.146	0,u^+	0	6	0	3	1	1	−1	6	22	96
13 938.1	1.157	1,*g*	0	5	0	5	3	2	−2	5	22	41
		1,*g*	0	5	0	5	−1	2	2	5	22	41
13 938.3	1.201	2,*u*								1	21	<25
13 938.7	1.202	0,u^+								1	21	<25
13 938.7	1.202	0,g^-								1	21	<25
13 938.8	1.146	2,*u*	0	6	0	3	3	1	−1	6	22	82
13 938.9	1.176	0,g^-	2	1	0	2	−2	6	2	3	21	30
13 939.4	1.165	1,*g*	2	2	0	1	−1	4	2	4	21	26
13 939.4	1.185	0,g^+								2	22	<25
13 939.6	1.185	0,u^+								2	22	<25
13 940.9	1.165	2,*u*								4	22	<25
13 941.1	1.201	2,*g*								1	21	<25
13 941.1	1.216	2,*u*								0	22	<25
13 941.1	1.216	2,*g*								0	22	<25
13 941.2	1.214	1,*g*								0	21	<25
13 941.3	1.174	2,*g*								3	21	<25
13 943.5	1.154	0,g^+	2	3	0	0	0	2	0	5	21	26
		0,g^+	1	4	0	0	0	4	0	5	21	38
		0,g^+	0	5	0	0	0	6	0	5	21	32
13 943.7	1.199	0,u^-								1	21	<25
13 944.7	1.185	0,u^-								2	22	<25
13 944.8	1.187	1,*u*								2	21	<25
13 944.8	1.185	0,g^-								2	22	<25
13 945.4	1.171	1,*u*								3	22	<25
13 945.6	1.181	0,g^+								3	21	<25
13 945.8	1.171	2,*u*	2	0	1	0	0	6	2	3	21	37
13 946.3	1.187	1,*g*								2	21	<25
13 946.6	1.171	1,*g*								3	22	<25
13 947.2	1.202	2,*g*								1	21	<25
13 947.2	1.185	2,*u*								2	22	<25
13 947.3	1.185	2,*g*								2	22	<25
13 947.5	1.163	1,*g*	2	2	0	1	−1	4	2	4	21	30
		1,*g*	1	2	1	0	0	5	1	4	21	36
13 947.5	1.200	0,g^-								1	21	<25
13 947.8	1.167	1,*u*	0	3	1	1	1	6	0	4	21	39
		1,*u*	0	3	1	1	−1	6	2	4	21	47
13 948.8	1.188	1,*g*								2	21	<25
13 949.1	1.202	2,*g*								1	21	<25
13 949.2	1.162	0,g^+								4	22	<25
13 949.3	1.200	2,*u*								1	21	<25
13 949.4	1.176	2,*g*								3	21	<25
13 949.7	1.163	1,*g*	2	2	0	1	1	4	0	4	21	33
		1,*g*	1	2	1	0	0	5	1	4	21	33
13 950.5	1.203	0,g^+								1	21	<25
13 950.6	1.173	1,*u*								3	22	<25
13 950.7	1.201	2,*g*								1	21	<25
13 951.0	1.180	0,u^+	0	3	0	3	3	9	−3	3	21	36
13 952.2	1.185	2,*g*								2	22	<25
13 952.3	1.185	2,*u*								2	22	<25
13 952.8	1.188	1,*u*								2	21	<25
13 953.2	1.188	1,*g*								2	21	<25
13 953.4	1.162	2,*g*								4	22	<25
13 954.7	1.184	0,g^+								2	22	<25
13 955.0	1.163	0,u^+								4	22	<25
13 955.2	1.184	0,u^+								2	22	<25
13 956.4	1.154	2,*g*	1	4	0	0	0	4	2	5	21	44
		2,*g*	0	5	0	0	0	6	2	5	21	31
13 956.5	1.174	1,*u*								3	22	<25
13 956.6	1.201	2,*u*								1	21	<25
13 957.2	1.188	1,*g*								2	21	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 957.5	1.180	2,*g*								3	21	<25
13 957.6	1.187	1,*u*								2	21	<25
13 957.7	1.163	2,*u*								4	22	<25
13 958.0	1.201	$0,u^-$								1	21	<25
13 959.1	1.152	1,*g*	1	4	0	5	1	0	0	5	22	62
13 959.1	1.165	$0,g^+$								4	22	<25
13 959.3	1.200	$0,g^+$								1	21	<25
13 959.4	1.202	2,*u*								1	21	<25
13 959.6	1.213	1,*g*								0	21	<25
13 960.3	1.191	1,*g*								2	21	<25
13 961.0	1.203	$0,u^+$								1	21	<25
13 961.2	1.188	1,*u*								2	21	<25
13 961.7	1.184	2,*g*								2	22	<25
13 961.7	1.180	2,*u*								3	21	<25
13 961.9	1.164	2,*g*								4	22	<25
13 962.4	1.184	2,*u*								2	22	<25
13 962.8	1.201	$0,u^+$								1	21	<25
13 963.6	1.200	1,*u*								1	22	<25
13 963.6	1.200	1,*g*								1	22	<25
13 963.6	1.174	1,*g*								3	22	<25
13 964.5	1.146	$0,u^-$	0	6	0	3	−1	1	1	6	22	99
13 965.9	1.186	1,*g*								2	21	<25
13 966.4	1.200	2,*g*								1	21	<25
13 966.4	1.162	$0,g^-$								4	22	<25
13 966.6	1.164	$0,g^+$								4	22	<25
13 967.3	1.178	$0,u^-$	0	2	1	2	−2	8	2	3	21	55
13 969.3	1.174	1,*g*								3	22	<25
13 969.5	1.188	$0,u^-$								2	22	<25
13 969.5	1.188	$0,g^-$								2	22	<25
13 969.6	1.175	1,*u*								3	22	<25
13 970.1	1.202	2,*g*								1	21	<25
13 970.3	1.179	$0,g^+$	1	2	0	2	2	8	−2	3	21	30
13 970.6	1.146	2,*u*	0	6	0	3	1	1	1	6	22	83
13 970.7	1.165	2,*g*								4	22	<25
13 971.8	1.189	1,*u*								2	21	<25
13 972.2	1.215	1,*u*								0	21	<25
13 973.4	1.174	$0,g^-$	2	1	0	2	−2	6	2	3	21	40
		$0,g^-$	1	1	1	1	−1	7	1	3	21	40
13 974.4	1.163	2,*g*								4	22	<25
13 974.8	1.201	2,*u*								1	21	<25
13 975.4	1.188	2,*u*								2	22	<25
13 975.5	1.188	2,*g*								2	22	<25
13 975.5	1.160	$0,u^+$	1	2	1	6	0	0	0	4	22	26
13 976.6	1.162	$0,u^-$								4	22	<25
13 976.7	1.161	2,*u*								4	22	<25
13 977.0	1.164	$0,g^+$								4	22	<25
13 979.0	1.202	$0,u^+$								1	21	<25
13 979.1	1.165	2,*g*								4	22	<25
13 979.1	1.175	1,*g*								3	22	<25
13 979.7	1.212	1,*g*								0	21	<25
13 979.7	1.190	1,*u*								2	21	<25
13 979.8	1.202	$0,u^-$								1	21	<25
13 980.5	1.202	2,*u*								1	21	<25
13 980.5	1.215	1,*g*								0	21	<25
13 980.6	1.177	$0,u^-$	1	2	0	3	−1	7	1	3	21	43
13 980.7	1.174	1,*u*								3	22	<25
13 981.1	1.178	2,*u*	0	2	1	2	2	8	0	3	21	27
		2,*u*	0	2	1	2	−2	8	4	3	21	26
13 982.5	1.170	$0,u^+$	3	0	0	1	1	5	−1	3	21	60
13 982.7	1.176	2,*g*								3	21	<25
13 983.1	1.212	1,*u*								0	21	<25
13 983.5	1.202	$0,g^+$								1	21	<25
13 983.8	1.162	2,*u*								4	22	<25
13 984.6	1.190	1,*u*								2	21	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
13 984.7	1.190	1,*g*								2	21	<25
13 984.8	1.202	2,*g*								1	21	<25
13 985.3	1.157	0,g^+	1	4	0	0	0	4	0	5	21	34
		0,g^+	0	5	0	0	0	6	0	5	21	63
13 985.8	1.168	1,*g*	1	3	0	1	−1	6	2	4	21	28
13 985.8	1.177	2,*g*								3	21	<25
13 986.0	1.186	0,u^+								2	22	<25
13 986.1	1.157	1,*g*	0	5	0	5	1	2	0	5	22	52
		1,*g*	0	5	0	5	−1	2	2	5	22	28
13 986.2	1.187	0,g^+								2	22	<25
13 988.1	1.201	0,g^-								1	21	<25
13 988.2	1.172	1,*u*								3	22	<25
13 989.4	1.174	1,*g*								3	22	<25
13 990.2	1.190	1,*g*								2	21	<25
13 990.4	1.177	2,*u*								3	21	<25
13 991.8	1.202	2,*u*								1	21	<25
13 992.5	1.186	2,*u*								2	22	<25
13 992.7	1.186	2,*g*								2	22	<25
13 992.8	1.161	2,*g*								4	22	<25
13 992.8	1.167	0,u^+	0	4	0	7	3	3	−3	4	22	40
13 992.9	1.174	1,*u*								3	22	<25
13 993.4	1.215	1,*u*								0	21	<25
13 993.7	1.164	0,g^-	0	3	1	7	−1	1	1	4	22	32
13 993.8	1.166	1,*g*	1	3	0	1	1	6	0	4	21	30
		1,*g*	1	3	0	1	−1	6	2	4	21	26
13 994.1	1.202	2,*u*								1	21	<25
13 994.3	1.178	0,g^-	1	2	0	2	−2	8	2	3	21	42
13 995.5	1.161	0,g^+								4	22	<25
13 996.8	1.170	2,*u*	3	0	0	1	−1	5	3	3	21	39
13 996.8	1.177	0,g^+	0	1	2	0	0	8	0	3	21	51
13 997.1	1.189	1,*u*								2	21	<25
13 997.4	1.157	2,*g*	1	4	0	0	0	4	2	5	21	32
		2,*g*	0	5	0	0	0	6	2	5	21	65
13 997.5	1.201	1,*u*								1	22	<25
13 997.5	1.201	1,*g*								1	22	<25
13 997.7	1.201	2,*g*								1	21	<25
13 997.7	1.172	1,*g*								3	22	<25
13 999.0	1.165	2,*g*	0	3	1	7	1	1	1	4	22	32
13 999.5	1.173	1,*u*								3	22	<25
14 000.0	1.167	2,*u*	0	4	0	7	−1	3	3	4	22	31
14 000.2	1.202	0,g^+								1	21	<25
14 001.1	1.172	1,*g*								3	22	<25
14 001.3	1.157	1,*u*	3	1	0	0	0	3	1	4	21	81
14 001.8	1.176	0,u^+								3	21	<25
14 001.9	1.216	0,u^-								0	22	<25
14 001.9	1.216	0,g^-								0	22	<25
14 002.0	1.161	0,u^+								4	22	<25
14 002.8	1.190	1,*g*								2	21	<25
14 002.8	1.175	1,*u*								3	22	<25
14 002.9	1.161	2,*u*	1	1	2	3	3	1	−1	4	22	27
14 003.4	1.202	2,*g*								1	21	<25
14 004.6	1.156	1,*u*	0	5	0	4	4	3	−3	5	22	27
14 005.0	1.215	1,*u*								0	21	<25
14 005.1	1.173	0,g^+	2	1	0	2	2	6	−2	3	21	27
		0,g^+	2	1	0	2	0	6	0	3	21	37
14 005.4	1.152	1,*g*	0	3	2	3	1	0	0	5	22	30
14 006.0	1.203	0,u^-								1	21	<25
14 006.6	1.178	2,*g*								3	21	<25
14 008.4	1.174	1,*g*								3	22	<25
14 008.5	1.169	0,u^-	3	0	0	1	−1	5	1	3	21	82
14 009.3	1.164	0,g^-	0	4	0	6	−4	4	4	4	22	28
14 009.4	1.212	1,*u*								0	21	<25
14 010.1	1.201	0,g^+								1	21	<25
14 010.7	1.191	1,*g*								2	21	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 011.3	1.185	$0,u^+$								2	22	<25
14 011.4	1.216	$2,u$								0	22	<25
14 011.4	1.216	$2,g$								0	22	<25
14 011.6	1.189	$1,g$								2	21	<25
14 011.6	1.185	$0,g^+$								2	22	<25
14 011.8	1.177	$2,g$	0	1	2	0	0	8	2	3	21	43
14 012.2	1.201	$0,u^+$								1	21	<25
14 012.8	1.172	$1,u$								3	22	<25
14 012.8	1.216	$1,g$								0	21	<25
14 012.9	1.187	$1,u$	2	0	0	2	0	9	1	2	21	31
14 012.9	1.204	$2,u$								1	21	<25
14 013.6	1.201	$2,g$								1	21	<25
14 013.8	1.163	$2,g$								4	22	<25
14 014.9	1.202	$0,g^+$								1	21	<25
14 015.3	1.202	$0,g^-$								1	21	<25
14 015.9	1.201	$2,u$								1	21	<25
14 016.0	1.176	$2,u$	1	1	1	0	0	8	2	3	21	26
14 016.2	1.162	$2,u$	1	3	0	7	3	1	−1	4	22	38
14 016.3	1.162	$0,u^+$	1	3	0	7	1	1	−1	4	22	46
14 017.1	1.173	$1,g$								3	22	<25
14 017.4	1.173	$2,g$	2	1	0	2	0	6	2	3	21	35
14 017.4	1.185	$0,u^-$								2	22	<25
14 017.9	1.202	$1,u$								1	22	<25
14 017.9	1.202	$1,g$								1	22	<25
14 018.1	1.185	$0,g^-$								2	22	<25
14 019.0	1.185	$2,u$								2	22	<25
14 019.2	1.185	$2,g$								2	22	<25
14 019.2	1.179	$0,u^+$	0	2	1	2	2	8	−2	3	21	28
		$0,u^+$	0	2	1	2	0	8	0	3	21	32
14 019.7	1.203	$0,g^-$								1	21	<25
14 021.4	1.184	$2,u$								2	22	<25
14 021.5	1.169	$2,u$	3	0	0	1	1	5	1	3	21	44
		$2,u$	3	0	0	1	−1	5	3	3	21	35
14 021.5	1.203	$0,g^+$								1	21	<25
14 021.6	1.184	$2,g$								2	22	<25
14 022.1	1.188	$1,u$								2	21	<25
14 022.1	1.162	$0,g^+$								4	22	<25
14 022.4	1.175	$1,g$								3	22	<25
14 022.5	1.201	$2,g$								1	21	<25
14 022.8	1.189	$1,u$								2	21	<25
14 022.9	1.135	$1,g$	0	7	0	1	1	0	0	7	22	100
14 023.0	1.201	$0,u^-$								1	21	<25
14 023.1	1.163	$2,g$								4	22	<25
14 023.8	1.161	$0,u^-$	1	1	2	3	−1	1	1	4	22	36
14 026.4	1.173	$1,g$								3	22	<25
14 026.4	1.187	$1,g$								2	21	<25
14 027.1	1.200	$1,u$								1	22	<25
14 027.1	1.200	$1,g$								1	22	<25
14 027.2	1.171	$1,u$								3	22	<25
14 027.9	1.190	$1,u$								2	21	<25
14 028.3	1.161	$2,u$								4	22	<25
14 029.0	1.173	$1,g$								3	22	<25
14 029.6	1.185	$0,g^+$								2	22	<25
14 029.8	1.156	$1,u$	0	5	0	4	4	3	−3	5	22	44
14 030.0	1.175	$1,u$								3	22	<25
14 030.3	1.179	$2,u$	0	2	1	2	0	8	2	3	21	30
14 030.8	1.204	$0,u^+$								1	21	<25
14 031.6	1.202	$2,g$								1	21	<25
14 031.6	1.185	$0,u^+$								2	22	<25
14 031.7	1.186	$2,g$								2	22	<25
14 031.9	1.200	$2,u$								1	21	<25
14 032.3	1.201	$0,g^-$								1	21	<25
14 033.1	1.187	$0,u^-$								2	22	<25
14 033.2	1.186	$2,u$								2	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 033.8	1.189	1,*g*								2	21	<25
14 034.0	1.173	1,*g*								3	22	<25
14 034.0	1.187	0,g^-								2	22	<25
14 034.3	1.203	2,*g*								1	21	<25
14 034.5	1.190	1,*u*								2	21	<25
14 034.6	1.174	1,*u*								3	22	<25
14 035.7	1.214	1,*g*								0	21	<25
14 035.7	1.201	0,u^+								1	21	<25
14 035.8	1.187	0,u^+								2	22	<25
14 036.4	1.186	0,g^+								2	22	<25
14 037.8	1.189	1,*g*								2	21	<25
14 038.0	1.216	1,*u*								0	21	<25
14 038.4	1.182	0,u^-	0	3	0	3	−1	9	1	3	21	32
14 038.4	1.181	0,g^-	1	2	0	2	−2	8	2	3	21	29
		0,g^-	0	3	0	2	−2	10	2	3	21	53
14 038.5	1.153	1,*u*	1	3	1	3	1	0	0	5	22	29
14 038.8	1.214	0,u^+								0	20	<25
14 038.8	1.214	0,g^-								0	20	<25
14 039.0	1.179	0,g^+	0	2	1	1	1	9	−1	3	21	58
14 039.2	1.172	1,*u*								3	22	<25
14 039.4	1.216	1,*g*								0	21	<25
14 039.9	1.186	2,*g*								2	22	<25
14 040.6	1.187	2,*u*								2	22	<25
14 040.9	1.203	2,*g*								1	21	<25
14 041.4	1.203	2,*u*								1	21	<25
14 041.5	1.186	0,g^-								2	22	<25
14 041.7	1.174	1,*u*								3	22	<25
14 041.8	1.187	2,*g*								2	22	<25
14 041.8	1.170	1,*g*	0	4	0	1	1	8	0	4	21	39
		1,*g*	0	4	0	1	−1	8	2	4	21	32
14 042.1	1.186	2,*u*								2	22	<25
14 042.5	1.173	1,*g*								3	22	<25
14 042.6	1.186	0,u^-								2	22	<25
14 043.0	1.167	0,g^+	0	4	0	6	4	4	−4	4	22	39
14 043.9	1.214	2,*g*								0	20	<25
14 043.9	1.214	2,*u*								0	20	<25
14 043.9	1.201	2,*g*								1	21	<25
14 044.0	1.154	1,*g*	0	4	1	4	2	1	−1	5	22	51
		1,*g*	0	4	1	4	0	1	1	5	22	29
14 044.6	1.164	0,u^+								4	22	<25
14 044.8	1.186	0,g^+								2	22	<25
14 045.3	1.186	0,u^+								2	22	<25
14 045.4	1.202	2,*u*								1	21	<25
14 047.1	1.166	2,*g*								4	22	<25
14 047.5	1.187	2,*g*								2	22	<25
14 047.5	1.202	0,u^-								1	21	<25
14 047.6	1.215	1,*g*								0	21	<25
14 048.7	1.186	2,*u*								2	22	<25
14 048.8	1.180	2,*g*								3	21	<25
14 048.8	1.187	0,g^+								2	22	<25
14 049.4	1.163	2,*u*	0	3	1	6	4	2	−2	4	22	31
14 049.4	1.191	1,*u*								2	21	<25
14 050.0	1.188	0,u^+								2	22	<25
14 050.1	1.181	2,*u*								3	21	<25
14 050.3	1.185	2,*u*								2	22	<25
14 050.4	1.174	1,*g*								3	22	<25
14 051.0	1.152	1,*g*	0	3	2	3	1	0	0	5	22	31
		1,*g*	0	4	1	4	0	1	1	5	22	41
14 051.1	1.164	0,u^-	1	3	0	7	−1	1	1	4	22	35
14 051.4	1.185	2,*g*								2	22	<25
14 051.4	1.202	0,u^+								1	21	<25
14 052.5	1.173	1,*u*								3	22	<25
14 052.9	1.191	1,*g*								2	21	<25
14 053.7	1.189	1,*u*								2	21	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 054.3	1.188	2,*u*								2	22	<25
14 054.4	1.172	1,*g*								3	22	<25
14 054.6	1.157	0,g^+	2	0	2	0	0	2	0	4	22	46
		0,g^+	0	0	4	0	0	2	0	4	22	32
14 055.0	1.187	2,*g*								2	22	<25
14 055.2	1.179	2,*g*	0	2	1	1	1	9	1	3	21	31
14 055.8	1.186	0,g^+								2	22	<25
14 055.9	1.173	1,*u*								3	22	<25
14 056.1	1.174	1,*g*								3	22	<25
14 056.2	1.175	0,u^+	2	1	0	1	1	7	−1	3	21	40
		0,u^+	1	1	1	0	0	8	0	3	21	44
14 056.9	1.163	2,*u*								4	22	<25
14 057.0	1.160	0,u^+	1	0	3	0	0	2	0	4	22	28
14 057.7	1.160	0,u^+	1	0	3	0	0	2	0	4	22	36
14 057.8	1.163	0,g^-								4	22	<25
14 058.6	1.168	1,*g*	0	3	1	0	0	7	1	4	21	88
14 059.0	1.164	1,*u*	2	2	0	0	0	5	1	4	21	48
		1,*u*	1	3	0	0	0	7	1	4	21	30
14 059.1	1.163	2,*g*								4	22	<25
14 059.6	1.203	2,*u*								1	21	<25
14 060.0	1.174	1,*u*								3	22	<25
14 060.0	1.180	0,u^+	0	3	0	1	1	11	−1	3	21	32
14 060.4	1.157	0,g^+	0	0	4	2	0	0	0	4	22	43
14 060.5	1.174	1,*g*								3	22	<25
14 060.9	1.186	2,*u*								2	22	<25
14 061.0	1.174	1,*u*								3	22	<25
14 061.2	1.216	0,u^+								0	22	<25
14 061.2	1.216	0,g^+								0	22	<25
14 061.6	1.201	2,*u*								1	21	<25
14 061.8	1.185	0,u^+								2	22	<25
14 061.8	1.161	0,g^+								4	22	<25
14 062.2	1.173	1,*g*								3	22	<25
14 062.3	1.164	2,*u*								4	22	<25
14 062.8	1.189	1,*g*								2	21	<25
14 063.7	1.157	2,*g*	0	0	4	2	2	0	0	4	22	47
14 063.9	1.186	2,*g*								2	22	<25
14 064.1	1.167	0,u^-	0	4	0	7	−1	3	1	4	22	37
14 064.4	1.200	1,*g*								1	22	<25
14 064.4	1.200	1,*u*								1	22	<25
14 064.8	1.143	0,u^+	0	5	1	2	0	0	0	6	22	96
14 065.5	1.202	0,u^-								1	21	<25
14 065.6	1.217	1,*u*								0	21	<25
14 066.2	1.175	1,*g*								3	22	<25
14 066.5	1.156	1,*u*	0	5	0	4	−2	3	3	5	22	30
14 067.0	1.163	2,*g*								4	22	<25
14 067.0	1.163	0,u^-	0	2	2	5	−1	1	1	4	22	28
14 067.1	1.174	1,*u*								3	22	<25
14 067.3	1.185	0,g^+								2	22	<25
14 068.1	1.143	2,*u*	0	5	1	2	2	0	0	6	22	97
14 068.2	1.185	0,u^+								2	22	<25
14 068.5	1.211	1,*g*	0	0	0	21	1	0	0	0	21	45
14 068.5	1.186	0,u^-								2	22	<25
14 068.6	1.178	0,g^+	1	2	0	2	2	8	−2	3	21	27
		0,g^+	1	2	0	2	0	8	0	3	21	31
14 069.0	1.203	0,u^+								1	21	<25
14 069.2	1.203	2,*u*								1	21	<25
14 069.8	1.175	2,*u*	2	1	0	1	−1	7	3	3	21	25
		2,*u*	1	1	1	0	0	8	2	3	21	45
14 069.9	1.186	2,*g*								2	22	<25
14 069.9	1.174	1,*u*								3	22	<25
14 069.9	1.216	0,u^+								0	22	<25
14 069.9	1.216	0,g^+								0	22	<25
14 070.1	1.167	2,*u*								4	22	<25
14 070.6	1.186	2,*u*								2	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 070.8	1.190	1,*u*	0	0	2	0	0	11	1	2	21	33
14 070.9	1.157	2,*g*	2	0	2	0	0	2	2	4	22	42
		2,*g*	0	0	4	0	0	2	2	4	22	29
14 071.8	1.214	$0,u^-$								0	20	<25
14 071.8	1.214	$0,g^+$								0	20	<25
14 072.5	1.157	2,*u*	1	0	3	0	0	2	2	4	22	58
14 073.0	1.190	1,*u*								2	21	<25
14 073.3	1.202	1,*g*								1	22	<25
14 073.3	1.202	1,*u*								1	22	<25
14 073.8	1.189	1,*g*								2	21	<25
14 073.9	1.180	2,*u*								3	21	<25
14 074.1	1.202	$0,g^-$								1	21	<25
14 074.7	1.215	1,*g*								0	21	<25
14 074.9	1.215	2,*u*								0	22	<25
14 074.9	1.152	1,*u*	1	4	0	4	2	1	−1	5	22	29
14 074.9	1.215	2,*g*								0	22	<25
14 075.5	1.215	1,*u*								0	21	<25
14 075.6	1.203	2,*g*								1	21	<25
14 075.7	1.184	2,*g*								2	22	<25
14 075.8	1.186	$0,g^+$								2	22	<25
14 076.0	1.164	$0,u^+$								4	22	<25
14 076.8	1.185	2,*u*								2	22	<25
14 076.9	1.174	1,*u*								3	22	<25
14 076.9	1.201	$0,u^-$								1	21	<25
14 077.2	1.163	2,*u*								4	22	<25
14 077.2	1.202	$0,g^-$								1	21	<25
14 077.7	1.163	2,*g*	1	3	0	6	4	2	−2	4	22	40
14 078.3	1.174	1,*g*								3	22	<25
14 078.8	1.202	$0,g^+$								1	21	<25
14 079.0	1.186	$0,u^-$								2	22	<25
14 079.4	1.202	2,*g*								1	21	<25
14 079.5	1.178	2,*g*	1	2	0	2	0	8	2	3	21	31
14 079.9	1.185	$0,g^-$								2	22	<25
14 080.1	1.202	2,*u*								1	21	<25
14 080.4	1.186	2,*u*								2	22	<25
14 080.4	1.163	$0,g^+$	1	3	0	6	2	2	−2	4	22	35
14 080.7	1.214	2,*g*								0	20	<25
14 080.7	1.214	2,*u*								0	20	<25
14 081.5	1.192	1,*u*								2	21	<25
14 082.0	1.175	1,*g*								3	22	<25
14 082.3	1.166	$0,u^-$								4	22	<25
14 083.1	1.162	$0,g^-$	1	2	1	5	−1	1	1	4	22	38
14 083.4	1.146	$0,g^+$	0	6	0	2	2	2	−2	6	22	55
		$0,g^+$	0	6	0	2	0	2	0	6	22	34
14 083.6	1.162	2,*g*								4	22	<25
14 083.9	1.203	$0,u^+$								1	21	<25
14 084.4	1.201	1,*g*								1	22	<25
14 084.4	1.201	1,*u*								1	22	<25
14 084.4	1.202	2,*u*								1	21	<25
14 084.4	1.176	1,*g*								3	22	<25
14 084.9	1.160	$0,u^+$								4	22	<25
14 085.3	1.185	2,*g*								2	22	<25
14 085.6	1.174	1,*u*								3	22	<25
14 085.8	1.164	2,*u*								4	22	<25
14 087.0	1.186	$0,u^+$								2	22	<25
14 087.5	1.216	2,*u*								0	22	<25
14 087.5	1.216	2,*g*								0	22	<25
14 087.6	1.202	$0,g^+$								1	21	<25
14 087.8	1.153	1,*u*	1	4	0	4	2	1	−1	5	22	26
		1,*u*	1	4	0	4	0	1	1	5	22	44
14 088.0	1.175	1,*u*								3	22	<25
14 089.7	1.174	1,*u*								3	22	<25
14 089.8	1.163	$0,u^+$								4	22	<25
14 090.1	1.160	2,*u*								4	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 090.3	1.214	1,u								0	21	<25
14 090.3	1.187	0,g^-								2	22	<25
14 090.4	1.174	0,u^-	2	1	0	1	−1	7	1	3	21	66
14 090.6	1.186	0,g^+								2	22	<25
14 090.9	1.175	1,u								3	22	<25
14 091.4	1.200	1,u								1	22	<25
14 091.4	1.200	1,g								1	22	<25
14 091.8	1.188	1,u								2	21	<25
14 092.3	1.163	0,g^+								4	22	<25
14 092.4	1.174	1,g								3	22	<25
14 092.6	1.203	0,u^-								1	21	<25
14 093.2	1.204	0,g^+								1	21	<25
14 093.4	1.186	2,u								2	22	<25
14 093.4	1.170	0,g^+	3	0	0	0	0	6	0	3	21	80
14 094.2	1.149	1,u	0	2	3	1	1	0	0	5	22	29
		1,u	1	3	1	3	1	0	0	5	22	40
14 094.2	1.175	1,g								3	22	<25
14 094.8	1.186	2,g								2	22	<25
14 095.0	1.202	2,g								1	21	<25
14 095.7	1.187	1,g								2	21	<25
14 096.5	1.159	0,g^+								4	22	<25
14 096.8	1.203	2,u								1	21	<25
14 096.9	1.202	2,g								1	21	<25
14 097.5	1.148	1,g	1	2	2	1	1	0	0	5	22	70
14 097.5	1.189	1,g								2	21	<25
14 097.9	1.175	1,g								3	22	<25
14 098.1	1.214	1,u								0	21	<25
14 099.0	1.186	2,g								2	22	<25
14 099.4	1.163	2,u								4	22	<25
14 099.5	1.164	2,g								4	22	<25
14 099.6	1.189	0,u^-								2	22	<25
14 099.8	1.147	0,g^-	0	6	0	2	−2	2	2	6	22	97
14 100.1	1.168	0,g^-	0	4	0	6	−2	4	2	4	22	41
14 100.5	1.189	0,g^-								2	22	<25
14 100.8	1.186	2,u								2	22	<25
14 100.8	1.173	1,u								3	22	<25
14 100.8	1.180	0,g^-	0	2	1	1	−1	9	1	3	21	75
14 101.0	1.145	2,g	0	6	0	2	2	2	0	6	22	51
14 101.1	1.186	0,g^+								2	22	<25
14 101.5	1.203	2,g								1	21	<25
14 101.7	1.186	0,u^+								2	22	<25
14 101.9	1.188	2,g								2	22	<25
14 102.0	1.188	2,u								2	22	<25
14 102.3	1.186	0,g^+								2	22	<25
14 102.6	1.163	0,u^-								4	22	<25
14 102.6	1.160	0,g^+	2	2	0	6	0	0	0	4	22	29
14 103.2	1.174	2,u	2	1	0	1	1	7	1	3	21	37
		2,u	2	1	0	1	−1	7	3	3	21	30
14 103.2	1.160	2,g	2	2	0	6	2	0	0	4	22	33
14 103.5	1.186	0,u^+								2	22	<25
14 103.6	1.164	2,u								4	22	<25
14 103.7	1.186	2,u								2	22	<25
14 104.6	1.167	1,u	2	2	0	0	0	5	1	4	21	29
		1,u	1	3	0	0	0	7	1	4	21	31
		1,u	0	4	0	0	0	9	1	4	21	33
14 104.6	1.185	0,g^-								2	22	<25
14 105.1	1.203	0,g^+	0	0	1	1	1	15	−1	1	21	32
14 105.4	1.164	0,u^+								4	22	<25
14 105.6	1.172	1,g								3	22	<25
14 105.9	1.175	1,u								3	22	<25
14 106.0	1.187	0,u^+								2	22	<25
14 106.6	1.163	0,g^-	1	3	0	6	−2	2	2	4	22	50
14 107.1	1.186	0,u^-								2	22	<25
14 107.2	1.202	0,g^-								1	21	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 107.3	1.186	2,*g*								2	22	<25
14 107.4	1.170	2,*g*	3	0	0	0	0	6	2	3	21	78
14 108.7	1.186	2,*g*								2	22	<25
14 109.0	1.191	1,*g*								2	21	<25
14 109.2	1.191	1,*g*								2	21	<25
14 109.6	1.215	1,*g*								0	21	<25
14 109.7	1.173	1,*g*								3	22	<25
14 110.0	1.166	2,*g*	0	4	0	6	−2	4	4	4	22	25
14 110.2	1.189	1,*u*								2	21	<25
14 110.4	1.186	0,u^-								2	22	<25
14 110.6	1.188	2,*u*								2	22	<25
14 111.1	1.215	1,*u*								0	21	<25
14 111.2	1.203	2,*u*								1	21	<25
14 111.3	1.163	2,*g*								4	22	<25
14 111.4	1.186	2,*g*								2	22	<25
14 111.7	1.143	0,g^+	1	5	0	2	0	0	0	6	22	80
14 112.3	1.185	2,*u*								2	22	<25
14 112.5	1.161	0,u^+								4	22	<25
14 112.9	1.180	2,*g*	0	2	1	1	1	9	1	3	21	33
		2,*g*	0	2	1	1	−1	9	3	3	21	37
14 113.4	1.200	1,*g*								1	22	<25
14 113.5	1.200	1,*u*								1	22	<25
14 114.1	1.181	0,u^+	1	2	0	1	1	9	−1	3	21	43
		0,u^+	0	3	0	1	1	11	−1	3	21	43
14 114.9	1.163	2,*u*								4	22	<25
14 116.3	1.176	1,*u*								3	22	<25
14 116.5	1.172	1,*g*								3	22	<25
14 117.0	1.187	0,g^-								2	22	<25
14 117.1	1.158	1,*u*	0	5	0	4	2	3	−1	5	22	30
		1,*u*	0	5	0	4	0	3	1	5	22	45
14 118.0	1.153	1,*u*	0	4	1	3	3	2	−2	5	22	28
14 118.3	1.187	2,*u*								2	22	<25
14 118.5	1.201	1,*g*								1	22	<25
14 118.5	1.201	1,*u*								1	22	<25
14 118.6	1.161	2,*g*								4	22	<25
14 118.7	1.161	0,g^-	1	1	2	2	−2	2	2	4	22	48
14 118.9	1.186	0,g^+								2	22	<25
14 119.0	1.174	1,*g*								3	22	<25
14 119.1	1.143	2,*g*	1	5	0	2	2	0	0	6	22	70
14 119.4	1.203	2,*g*								1	21	<25
14 121.0	1.174	1,*u*								3	22	<25
14 121.0	1.164	0,u^+								4	22	<25
14 121.4	1.203	2,*g*								1	21	<25
14 121.6	1.192	1,*g*								2	21	<25
14 122.1	1.174	1,*u*								3	22	<25
14 122.2	1.174	1,*g*								3	22	<25
14 122.3	1.186	2,*g*								2	22	<25
14 122.7	1.187	0,g^-								2	22	<25
14 124.2	1.186	0,u^+								2	22	<25
14 124.5	1.173	1,*u*								3	22	<25
14 124.8	1.187	0,u^-								2	22	<25
14 125.0	1.186	2,*u*								2	22	<25
14 125.3	1.187	0,g^+								2	22	<25
14 125.9	1.186	2,*g*								2	22	<25
14 126.0	1.172	1,*g*								3	22	<25
14 126.0	1.182	0,g^+	0	3	0	2	2	10	−2	3	21	26
		0,g^+	0	3	0	2	0	10	0	3	21	25
14 126.2	1.162	0,u^-	1	2	1	4	−2	2	2	4	22	26
14 127.1	1.215	0,u^-								0	22	<25
14 127.1	1.215	0,g^-								0	22	<25
14 127.5	1.181	2,*u*								3	21	<25
14 127.7	1.217	1,*g*								0	21	<25
14 127.9	1.186	0,u^+								2	22	<25
14 128.1	1.192	1,*u*	0	1	1	1	1	12	0	2	21	29

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 128.3	1.188	$0,u^-$								2	22	<25
14 128.4	1.146	$0,g^+$	0	6	0	2	2	2	−2	6	22	26
		$0,g^+$	0	6	0	2	0	2	0	6	22	63
14 128.5	1.186	$2,u$								2	22	<25
14 128.7	1.186	$2,g$								2	22	<25
14 128.9	1.163	$2,u$								4	22	<25
14 129.0	1.187	$0,g^+$								2	22	<25
14 129.4	1.188	$2,u$								2	22	<25
14 130.4	1.189	$1,g$	1	0	1	0	0	11	1	2	21	29
14 130.6	1.203	$0,u^+$								1	21	<25
14 130.9	1.187	$2,g$								2	22	<25
14 131.8	1.155	$1,g$								5	22	<25
14 131.9	1.188	$0,g^-$								2	22	<25
14 132.3	1.187	$0,u^+$								2	22	<25
14 132.4	1.164	$2,g$	0	3	1	5	5	3	−3	4	22	41
14 132.5	1.173	$1,u$								3	22	<25
14 132.6	1.215	$2,g$								0	22	<25
14 132.6	1.215	$2,u$								0	22	<25
14 133.3	1.174	$1,g$								3	22	<25
14 133.4	1.191	$1,u$								2	21	<25
14 133.5	1.187	$0,g^+$								2	22	<25
14 133.8	1.163	$2,u$								4	22	<25
14 134.0	1.162	$0,g^+$								4	22	<25
14 134.4	1.186	$2,g$								2	22	<25
14 135.8	1.147	$2,g$	0	6	0	2	2	2	0	6	22	38
		$2,g$	0	6	0	2	0	2	2	6	22	58
14 135.9	1.186	$2,u$								2	22	<25
14 136.0	1.203	$2,u$								1	21	<25
14 136.5	1.174	$1,u$								3	22	<25
14 137.3	1.186	$0,u^+$								2	22	<25
14 137.5	1.174	$1,g$								3	22	<25
14 137.7	1.187	$2,g$								2	22	<25
14 138.1	1.187	$2,u$								2	22	<25
14 138.2	1.153	$1,u$								5	22	<25
14 138.2	1.182	$2,g$	0	3	0	2	0	10	2	3	21	26
14 139.1	1.203	$0,g^-$								1	21	<25
14 139.3	1.203	$0,u^+$								1	21	<25
14 139.9	1.202	$0,g^+$								1	21	<25
14 140.2	1.175	$1,u$								3	22	<25
14 140.3	1.174	$1,g$								3	22	<25
14 140.3	1.162	$2,g$								4	22	<25
14 140.7	1.164	$0,g^+$								4	22	<25
14 141.0	1.202	$1,g$								1	22	<25
14 141.2	1.202	$1,u$								1	22	<25
14 142.1	1.187	$0,u^-$								2	22	<25
14 142.5	1.186	$0,g^+$								2	22	<25
14 142.6	1.203	$0,g^-$								1	21	<25
14 143.1	1.202	$2,g$								1	21	<25
14 143.2	1.173	$1,u$								3	22	<25
14 143.7	1.200	$1,g$								1	22	<25
14 144.0	1.203	$2,u$								1	21	<25
14 144.3	1.200	$1,u$								1	22	<25
14 145.1	1.175	$1,g$								3	22	<25
14 145.2	1.187	$2,u$								2	22	<25
14 145.4	1.215	$1,g$								0	21	<25
14 145.6	1.173	$1,u$								3	22	<25
14 145.9	1.187	$2,g$								2	22	<25
14 146.3	1.155	$0,u^+$	3	0	1	2	0	0	0	4	22	25
		$0,u^+$	0	0	4	1	1	1	−1	4	22	33
14 146.5	1.204	$2,g$								1	21	<25
14 147.3	1.216	$1,u$								0	21	<25
14 147.6	1.186	$2,u$								2	22	<25
14 147.6	1.187	$2,g$								2	22	<25
14 148.2	1.175	$1,g$								3	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 148.4	1.186	$0,g^-$								2	22	<25
14 148.7	1.186	$0,u^-$								2	22	<25
14 148.9	1.191	$1,u$								2	21	<25
14 150.1	1.179	$0,u^-$	1	2	0	1	−1	9	1	3	21	60
14 150.2	1.200	$1,g$								1	22	<25
14 150.2	1.200	$1,u$								1	22	<25
14 150.8	1.174	$1,u$								3	22	<25
14 150.9	1.187	$0,g^+$								2	22	<25
14 151.2	1.202	$0,u^-$								1	21	<25
14 151.6	1.187	$0,u^+$								2	22	<25
14 152.4	1.164	$2,u$	1	3	0	5	5	3	−3	4	22	46
14 152.7	1.187	$2,u$								2	22	<25
14 153.0	1.213	$1,g$								0	21	<25
14 153.0	1.175	$1,g$								3	22	<25
14 153.0	1.216	$0,u^-$								0	22	<25
14 153.0	1.216	$0,g^-$								0	22	<25
14 153.0	1.187	$0,g^+$								2	22	<25
14 153.3	1.163	$0,g^+$								4	22	<25
14 153.8	1.174	$1,u$								3	22	<25
14 153.9	1.168	$0,u^-$	0	4	0	5	−3	5	3	4	22	30
14 154.1	1.176	$1,g$								3	22	<25
14 154.1	1.187	$2,g$								2	22	<25
14 155.1	1.186	$2,u$								2	22	<25
14 155.2	1.186	$2,g$								2	22	<25
14 155.4	1.164	$0,g^-$	0	2	2	4	−2	2	2	4	22	30
		$0,g^-$	0	3	1	5	−3	3	3	4	22	37
14 155.7	1.165	$0,g^+$								4	22	<25
14 155.8	1.204	$0,u^+$	1	0	0	1	1	15	−1	1	21	26
14 156.1	1.164	$2,g$								4	22	<25
14 156.2	1.170	$1,u$	1	3	0	0	0	7	1	4	21	35
		$1,u$	0	4	0	0	0	9	1	4	21	59
14 156.2	1.173	$1,g$								3	22	<25
14 156.3	1.175	$1,u$								3	22	<25
14 156.3	1.216	$2,u$								0	22	<25
14 156.3	1.216	$2,g$								0	22	<25
14 156.7	1.155	$2,u$	3	0	1	2	2	0	0	4	22	39
14 156.8	1.164	$0,u^+$								4	22	<25
14 157.0	1.201	$1,g$								1	22	<25
14 157.0	1.201	$1,u$								1	22	<25
14 157.0	1.155	$1,g$								5	22	<25
14 157.7	1.188	$0,g^-$								2	22	<25
14 157.9	1.202	$2,u$								1	21	<25
14 158.1	1.202	$2,g$								1	21	<25
14 158.7	1.166	$2,u$								4	22	<25
14 158.8	1.201	$1,u$								1	22	<25
14 159.0	1.201	$1,g$								1	22	<25
14 159.1	1.186	$2,u$								2	22	<25
14 159.8	1.186	$0,u^+$								2	22	<25
14 160.2	1.174	$1,u$								3	22	<25
14 160.6	1.186	$0,u^-$								2	22	<25
14 160.8	1.176	$0,g^+$	2	1	0	0	0	8	0	3	21	51
14 160.9	1.163	$2,g$								4	22	<25
14 161.0	1.202	$0,u^-$								1	21	<25
14 161.3	1.204	$0,u^+$	0	1	0	1	1	17	−1	1	21	27
14 161.8	1.187	$1,u$								2	21	<25
14 161.9	1.187	$2,g$								2	22	<25
14 161.9	1.179	$2,u$	1	2	0	1	1	9	1	3	21	30
		$2,u$	1	2	0	1	−1	9	3	3	21	30
14 161.9	1.163	$0,u^+$								4	22	<25
14 162.6	1.174	$1,u$								3	22	<25
14 163.9	1.174	$1,g$								3	22	<25
14 164.2	1.187	$0,g^-$								2	22	<25
14 164.4	1.185	$2,u$								2	22	<25
14 165.2	1.163	$0,u^+$								4	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 165.5	1.155	1,g	0	5	0	3	3	4	−2	5	22	31
14 165.7	1.201	1,u								1	22	<25
14 165.7	1.203	0,g^+								1	21	<25
14 166.3	1.200	1,g								1	22	<25
14 166.5	1.188	0,u^+								2	22	<25
14 166.5	1.185	0,g^+								2	22	<25
14 166.6	1.175	1,u								3	22	<25
14 167.1	1.172	1,g								3	22	<25
14 167.1	1.181	0,u^+	0	2	1	0	0	10	0	3	21	82
14 167.5	1.203	2,u								1	21	<25
14 167.5	1.202	0,u^-								1	21	<25
14 167.6	1.161	2,u	2	2	0	5	3	1	−1	4	22	34
14 168.5	1.186	2,g								2	22	<25
14 169.8	1.203	0,g^+								1	21	<25
14 169.8	1.186	0,u^+								2	22	<25
14 170.0	1.175	1,g								3	22	<25
14 170.5	1.186	0,g^-								2	22	<25
14 170.7	1.202	2,u								1	21	<25
14 170.8	1.187	2,u								2	22	<25
14 171.1	1.186	2,g								2	22	<25
14 171.1	1.169	0,g^+	0	4	0	6	2	4	−2	4	22	29
		0,g^+	0	4	0	6	0	4	0	4	22	26
14 171.5	1.174	1,u								3	22	<25
14 171.8	1.163	2,g								4	22	<25
14 171.8	1.164	0,u^-								4	22	<25
14 171.9	1.192	1,g								2	21	<25
14 172.9	1.175	1,g								3	22	<25
14 172.9	1.188	0,g^+								2	22	<25
14 173.0	1.200	1,u								1	22	<25
14 173.2	1.164	2,u								4	22	<25
14 173.6	1.160	0,g^+	2	1	1	3	1	1	−1	4	22	32
14 174.6	1.186	2,g								2	22	<25
14 174.7	1.176	2,g	2	1	0	0	0	8	2	3	21	52
14 174.8	1.186	0,u^+								2	22	<25
14 174.8	1.186	0,g^+								2	22	<25
14 175.4	1.203	2,u								1	21	<25
14 175.5	1.172	1,u								3	22	<25
14 175.9	1.187	2,u								2	22	<25
14 176.2	1.187	0,u^-								2	22	<25
14 176.3	1.187	2,g								2	22	<25
14 176.3	1.153	1,u	0	3	2	2	2	1	−1	5	22	34
		1,u	0	4	1	3	3	2	−2	5	22	35
14 176.3	1.203	2,g								1	21	<25
14 176.3	1.165	2,g								4	22	<25
14 176.4	1.186	0,g^+								2	22	<25
14 176.7	1.157	0,u^-	2	0	2	1	−1	1	1	4	22	29
		0,u^-	0	0	4	1	−1	1	1	4	22	55
14 176.8	1.200	1,g								1	22	<25
14 177.3	1.192	1,u								2	21	<25
14 177.4	1.187	0,u^+								2	22	<25
14 177.9	1.155	1,g	0	5	0	3	−3	4	4	5	22	32
14 178.2	1.166	2,g								4	22	<25
14 178.3	1.190	1,g								2	21	<25
14 178.3	1.161	0,u^+	2	2	0	5	1	1	−1	4	22	42
14 178.4	1.154	1,u	0	4	1	3	1	2	0	5	22	60
14 178.4	1.215	0,u^+								0	22	<25
14 178.4	1.215	0,g^+								0	22	<25
14 178.6	1.175	1,u								3	22	<25
14 179.1	1.187	0,g^-								2	22	<25
14 179.5	1.163	0,g^+	0	2	2	4	0	2	0	4	22	25
14 179.6	1.187	2,u								2	22	<25
14 180.1	1.187	2,g								2	22	<25
14 180.1	1.173	1,g								3	22	<25
14 180.3	1.186	2,u								2	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 180.5	1.186	$0,u^-$								2	22	<25
14 180.7	1.181	$2,u$	0	2	1	0	0	10	2	3	21	79
14 181.4	1.200	$1,u$								1	22	<25
14 181.7	1.200	$1,g$								1	22	<25
14 182.0	1.164	$0,u^-$	1	3	0	5	−3	3	3	4	22	46
14 182.3	1.203	$2,u$								1	21	<25
14 182.3	1.175	$1,g$								3	22	<25
14 182.3	1.188	$0,u^-$								2	22	<25
14 182.5	1.163	$2,u$	1	2	1	4	2	2	0	4	22	27
14 182.5	1.215	$2,g$								0	22	<25
14 182.6	1.215	$2,u$								0	22	<25
14 182.6	1.203	$2,g$								1	21	<25
14 183.3	1.186	$2,u$								2	22	<25
14 184.4	1.176	$1,u$								3	22	<25
14 184.5	1.164	$2,g$								4	22	<25
14 184.8	1.175	$1,g$								3	22	<25
14 185.8	1.165	$0,g^-$								4	22	<25
14 186.2	1.187	$0,g^+$								2	22	<25
14 186.3	1.186	$2,g$								2	22	<25
14 186.5	1.155	$0,u^+$	3	0	1	2	0	0	0	4	22	38
14 187.1	1.200	$1,u$								1	22	<25
14 187.4	1.187	$2,u$								2	22	<25
14 187.7	1.164	$2,u$								4	22	<25
14 187.8	1.152	$1,u$	0	3	2	2	0	1	1	5	22	39
		$1,u$	0	4	1	3	−1	2	2	5	22	36
14 187.9	1.177	$1,u$								3	22	<25
14 188.1	1.200	$1,g$								1	22	<25
14 188.1	1.186	$2,g$								2	22	<25
14 188.4	1.188	$0,g^-$								2	22	<25
14 189.0	1.187	$0,u^+$								2	22	<25
14 189.2	1.200	$1,u$								1	22	<25
14 189.4	1.192	$1,g$	0	1	1	0	0	13	1	2	21	29
14 189.5	1.216	$1,u$								0	21	<25
14 189.8	1.170	$1,g$								3	22	<25
14 190.3	1.165	$0,g^-$	0	3	1	5	−1	3	1	4	22	30
14 190.8	1.216	$0,u^+$								0	22	<25
14 190.8	1.216	$0,g^+$								0	22	<25
14 191.0	1.187	$2,g$	1	1	0	8	8	6	−6	2	22	39
14 191.0	1.187	$2,u$								2	22	<25
14 192.6	1.186	$0,u^+$								2	22	<25
14 193.7	1.187	$0,g^+$								2	22	<25
14 194.1	1.163	$0,u^+$	1	2	1	4	0	2	0	4	22	26
14 194.4	1.174	$1,g$								3	22	<25
14 194.8	1.175	$1,u$								3	22	<25
14 194.9	1.174	$1,g$								3	22	<25
14 195.0	1.202	$0,g^-$	0	0	1	1	−1	15	1	1	21	26
14 195.7	1.200	$1,g$								1	22	<25
14 195.7	1.163	$2,u$								4	22	<25
14 195.7	1.200	$1,u$								1	22	<25
14 196.0	1.186	$0,u^-$								2	22	<25
14 196.7	1.216	$1,u$								0	21	<25
14 196.8	1.156	$2,u$	0	0	4	1	1	1	1	4	22	31
14 196.8	1.150	$1,g$	2	3	0	3	1	0	0	5	22	57
14 197.6	1.187	$2,g$								2	22	<25
14 197.7	1.199	$1,g$								1	22	<25
14 197.9	1.186	$2,u$								2	22	<25
14 198.5	1.160	$0,u^-$	2	2	0	5	−1	1	1	4	22	58
14 198.6	1.166	$2,g$	0	3	1	5	1	3	1	4	22	25
14 198.7	1.174	$1,u$								3	22	<25
14 198.9	1.187	$2,g$								2	22	<25
14 199.4	1.187	$0,g^+$								2	22	<25
14 199.7	1.194	$1,u$								2	21	<25
14 200.7	1.217	$1,g$								0	21	<25
14 200.8	1.186	$2,u$								2	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 200.9	1.187	$0,g^-$								2	22	<25
14 201.0	1.156	$1,g$								5	22	<25
14 201.5	1.159	$0,g^-$	2	1	1	3	−1	1	1	4	22	43
		$0,g^-$	0	1	3	3	−1	1	1	4	22	25
14 201.8	1.166	$0,g^+$								4	22	<25
14 202.5	1.173	$1,u$								3	22	<25
14 202.6	1.202	$0,u^-$	1	0	0	1	−1	15	1	1	21	26
14 202.8	1.175	$1,g$								3	22	<25
14 203.3	1.188	$2,g$								2	22	<25
14 203.6	1.159	$2,g$								4	22	<25
14 203.7	1.152	$1,g$	1	3	1	2	2	1	−1	5	22	27
14 203.7	1.188	$0,u^+$								2	22	<25
14 203.8	1.202	$2,g$								1	21	<25
14 204.0	1.187	$2,u$								2	22	<25
14 204.1	1.186	$0,g^+$								2	22	<25
14 204.7	1.215	$1,u$								0	21	<25
14 205.0	1.188	$0,g^+$								2	22	<25
14 205.1	1.216	$1,g$								0	21	<25
14 206.6	1.187	$0,u^+$								2	22	<25
14 206.7	1.200	$1,g$								1	22	<25
14 206.9	1.176	$1,g$								3	22	<25
14 207.1	1.200	$1,u$								1	22	<25
14 207.1	1.166	$0,u^+$								4	22	<25
14 207.7	1.183	$0,u^-$	0	3	0	1	−1	11	1	3	21	68
14 208.0	1.178	$1,g$								3	22	<25
14 208.1	1.173	$1,u$								3	22	<25
14 208.6	1.162	$2,u$								4	22	<25
14 208.9	1.186	$2,g$								2	22	<25
14 209.4	1.187	$0,u^+$								2	22	<25
14 209.6	1.187	$0,u^-$								2	22	<25
14 209.9	1.173	$1,g$								3	22	<25
14 210.0	1.200	$1,u$								1	22	<25
14 210.1	1.187	$2,u$								2	22	<25
14 211.0	1.164	$0,u^-$								4	22	<25
14 211.6	1.165	$2,g$								4	22	<25
14 211.6	1.187	$2,u$								2	22	<25
14 211.6	1.187	$0,g^+$								2	22	<25
14 212.4	1.203	$2,u$								1	21	<25
14 212.5	1.176	$1,u$	1	2	0	6	6	5	−5	3	22	25
14 212.7	1.187	$2,g$								2	22	<25
14 212.9	1.203	$0,g^+$								1	21	<25
14 213.4	1.200	$1,g$								1	22	<25
14 213.5	1.187	$0,u^+$								2	22	<25
14 214.2	1.200	$1,u$								1	22	<25
14 214.2	1.143	$0,g^+$	0	5	1	1	1	1	−1	6	22	83
14 214.4	1.187	$2,g$								2	22	<25
14 214.6	1.166	$2,u$								4	22	<25
14 214.6	1.188	$0,g^+$								2	22	<25
14 214.6	1.162	$0,g^+$								4	22	<25
14 214.7	1.166	$0,u^+$	0	4	0	5	3	5	−3	4	22	25
14 215.1	1.180	$0,g^+$	1	2	0	0	0	10	0	3	21	36
14 215.4	1.174	$1,u$								3	22	<25
14 215.5	1.187	$2,u$								2	22	<25
14 216.3	1.203	$0,g^-$								1	21	<25
14 216.4	1.154	$1,g$								5	22	<25
14 216.9	1.194	$1,g$								2	21	<25
14 216.9	1.187	$0,u^-$								2	22	<25
14 217.0	1.186	$0,g^+$								2	22	<25
14 218.1	1.201	$1,u$								1	22	<25
14 218.5	1.188	$0,g^-$								2	22	<25
14 218.6	1.188	$2,u$								2	22	<25
14 218.6	1.204	$0,u^+$	0	0	1	0	0	16	0	1	21	40
14 218.7	1.188	$0,g^-$	1	1	0	8	−6	6	6	2	22	26
14 219.0	1.201	$1,g$								1	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 219.0	1.166	2,*g*								4	22	<25
14 219.1	1.215	2,*g*								0	22	<25
14 219.4	1.215	2,*u*								0	22	<25
14 219.6	1.165	2,*u*	1	3	0	5	−1	3	3	4	22	30
14 219.7	1.203	2,*g*								1	21	<25
14 220.0	1.183	2,*u*	0	3	0	1	1	11	1	3	21	33
		2,*u*	0	3	0	1	−1	11	3	3	21	34
14 220.2	1.200	1,*g*								1	22	<25
14 220.4	1.187	2,*u*								2	22	<25
14 220.5	1.188	2,*g*								2	22	<25
14 220.5	1.216	0,u^+								0	22	<25
14 220.5	1.216	0,g^+								0	22	<25
14 220.7	1.187	1,*g*								2	21	<25
14 220.8	1.187	0,u^-								2	22	<25
14 221.2	1.175	1,*g*								3	22	<25
14 222.3	1.154	1,*g*	1	4	0	3	1	2	0	5	22	42
		1,*g*	1	4	0	3	−1	2	2	5	22	29
14 222.6	1.215	0,u^-	0	0	0	11	−9	11	9	0	22	26
14 222.6	1.215	0,g^-								0	22	<25
14 222.8	1.187	0,u^+								2	22	<25
14 223.0	1.190	1,*u*	2	0	0	0	0	11	1	2	21	35
14 223.5	1.187	2,*g*								2	22	<25
14 223.6	1.200	1,*u*								1	22	<25
14 223.6	1.215	2,*g*								0	22	<25
14 223.7	1.175	1,*g*								3	22	<25
14 223.7	1.173	1,*u*								3	22	<25
14 223.7	1.161	0,u^+	1	1	2	1	1	3	−1	4	22	37
14 223.8	1.187	0,g^-								2	22	<25
14 224.1	1.187	0,u^+								2	22	<25
14 224.6	1.215	2,*u*								0	22	<25
14 225.0	1.187	2,*g*								2	22	<25
14 225.2	1.200	1,*u*								1	22	<25
14 225.3	1.187	2,*u*								2	22	<25
14 225.3	1.187	0,u^-								2	22	<25
14 225.5	1.173	1,*g*								3	22	<25
14 226.1	1.201	1,*g*								1	22	<25
14 226.2	1.167	0,g^-	1	2	1	3	−3	3	3	4	22	25
		0,g^-	0	4	0	4	−4	6	4	4	22	34
14 226.5	1.173	1,*u*								3	22	<25
14 226.8	1.166	2,*u*								4	22	<25
14 227.0	1.136	1,*u*	0	7	0	0	0	1	1	7	22	100
14 227.7	1.187	2,*g*								2	22	<25
14 228.1	1.177	1,*u*								3	22	<25
14 228.4	1.180	2,*g*	1	2	0	0	0	10	2	3	21	37
14 228.5	1.186	2,*u*								2	22	<25
14 228.6	1.200	1,*u*								1	22	<25
14 229.0	1.187	2,*g*								2	22	<25
14 229.1	1.161	0,g^+								4	22	<25
14 229.4	1.175	1,*g*								3	22	<25
14 229.9	1.204	2,*u*	0	0	1	0	0	16	2	1	21	37
14 230.1	1.144	0,g^-	0	5	1	1	−1	1	1	6	22	97
14 230.3	1.205	0,u^+	0	1	0	1	1	17	−1	1	21	32
14 230.4	1.203	2,*g*								1	21	<25
14 230.8	1.201	1,*g*								1	22	<25
14 231.4	1.176	1,*u*								3	22	<25
14 231.7	1.172	1,*g*								3	22	<25
14 232.0	1.175	1,*u*								3	22	<25
14 232.4	1.186	2,*u*								2	22	<25
14 232.6	1.215	1,*u*								0	21	<25
14 232.7	1.215	1,*g*								0	21	<25
14 232.8	1.187	2,*g*								2	22	<25
14 232.9	1.201	1,*g*								1	22	<25
14 233.3	1.203	0,g^+								1	21	<25
14 233.8	1.159	2,*g*	3	1	0	4	2	0	0	4	22	35

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 234.3	1.149	1,g	0	2	3	0	0	1	1	5	22	45
14 234.9	1.187	0,g^+								2	22	<25
14 235.1	1.201	1,u								1	22	<25
14 235.2	1.187	2,u								2	22	<25
14 235.8	1.187	2,g								2	22	<25
14 235.8	1.200	1,g								1	22	<25
14 235.9	1.203	0,u^-								1	21	<25
14 236.1	1.187	0,u^+								2	22	<25
14 236.1	1.165	0,u^+								4	22	<25
14 236.2	1.158	0,g^+	3	1	0	4	0	0	0	4	22	43
14 236.4	1.162	0,g^-	0	1	3	1	−1	3	1	4	22	40
14 237.0	1.216	2,g								0	22	<25
14 237.1	1.174	1,u								3	22	<25
14 237.1	1.216	2,u								0	22	<25
14 237.4	1.203	2,g								1	21	<25
14 237.9	1.187	0,u^-								2	22	<25
14 238.4	1.144	2,g	0	5	1	1	1	1	1	6	22	96
14 238.7	1.161	2,u								4	22	<25
14 238.7	1.186	0,g^-								2	22	<25
14 239.2	1.162	2,g								4	22	<25
14 239.9	1.177	1,g								3	22	<25
14 240.0	1.176	1,u								3	22	<25
14 240.0	1.203	2,u								1	21	<25
14 240.1	1.148	1,u	1	2	2	0	0	1	1	5	22	66
14 240.6	1.188	2,u								2	22	<25
14 240.7	1.187	0,g^-								2	22	<25
14 240.9	1.188	0,u^-								2	22	<25
14 241.0	1.205	2,u								1	21	<25
14 241.0	1.201	1,u								1	22	<25
14 241.0	1.204	0,g^+	1	0	0	0	0	16	0	1	21	28
14 241.0	1.188	0,g^-								2	22	<25
14 241.8	1.201	1,g								1	22	<25
14 242.1	1.186	2,u								2	22	<25
14 242.7	1.175	1,g								3	22	<25
14 244.4	1.188	0,u^+								2	22	<25
14 244.7	1.187	0,g^+								2	22	<25
14 244.7	1.165	0,u^-	0	2	2	3	−3	3	3	4	22	25
		0,u^-	0	3	1	4	−4	4	4	4	22	35
14 245.0	1.187	0,u^-								2	22	<25
14 245.3	1.176	1,u								3	22	<25
14 245.6	1.200	1,g								1	22	<25
14 245.9	1.163	0,u^-	1	3	0	5	−1	3	1	4	22	33
14 246.4	1.163	2,g								4	22	<25
14 246.6	1.187	2,u								2	22	<25
14 246.7	1.193	1,g								2	21	<25
14 246.7	1.187	2,g								2	22	<25
14 246.8	1.188	0,g^+								2	22	<25
14 247.6	1.192	1,u								2	21	<25
14 248.1	1.165	2,u	0	3	1	4	4	4	−2	4	22	27
14 248.3	1.173	1,u								3	22	<25
14 248.7	1.187	2,g								2	22	<25
14 248.8	1.162	2,g	0	1	3	1	−1	3	3	4	22	28
14 248.9	1.187	0,g^-								2	22	<25
14 249.2	1.201	1,u								1	22	<25
14 249.4	1.175	1,g								3	22	<25
14 249.4	1.188	2,u								2	22	<25
14 249.7	1.215	2,g	0	0	0	12	12	10	−10	0	22	44
14 250.2	1.188	0,g^+								2	22	<25
14 250.3	1.187	0,u^+								2	22	<25
14 250.3	1.144	0,u^+	1	5	0	1	1	1	−1	6	22	50
		0,u^+	0	6	0	1	1	3	−1	6	22	40
14 251.4	1.173	1,u								3	22	<25
14 251.7	1.187	2,u								2	22	<25
14 251.7	1.204	2,g	1	0	0	0	0	16	2	1	21	35

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 251.8	1.201	1,*g*								1	22	<25
14 252.1	1.215	1,*g*								0	21	<25
14 252.6	1.174	1,*g*								3	22	<25
14 253.8	1.188	2,*g*								2	22	<25
14 254.1	1.158	1,*g*	0	5	0	3	1	4	0	5	22	45
		1,*g*	0	5	0	3	−1	4	2	5	22	31
14 255.1	1.201	1,*g*								1	22	<25
14 255.1	1.200	1,*u*								1	22	<25
14 255.4	1.173	1,*g*								3	22	<25
14 255.5	1.186	0,u^-								2	22	<25
14 255.6	1.174	1,*g*								3	22	<25
14 255.6	1.164	2,*u*	1	3	0	5	1	3	1	4	22	26
14 255.8	1.162	2,*g*	2	2	0	4	4	2	−2	4	22	47
14 256.0	1.201	1,*u*								1	22	<25
14 256.0	1.164	0,g^+								4	22	<25
14 256.1	1.187	2,*u*								2	22	<25
14 256.3	1.171	1,*u*								3	22	<25
14 256.7	1.188	2,*g*								2	22	<25
14 257.2	1.187	0,g^-								2	22	<25
14 257.7	1.188	0,u^+								2	22	<25
14 257.8	1.159	0,g^+								4	22	<25
14 257.9	1.176	1,*u*								3	22	<25
14 257.9	1.214	0,u^-								0	20	<25
14 257.9	1.214	0,g^+								0	20	<25
14 258.4	1.188	2,*u*								2	22	<25
14 258.9	1.215	2,*u*								0	22	<25
14 259.1	1.154	1,*g*								5	22	<25
14 259.2	1.200	1,*u*								1	22	<25
14 259.3	1.187	2,*g*								2	22	<25
14 259.3	1.215	0,u^+	0	0	0	11	9	11	−9	0	22	25
14 259.4	1.215	0,g^+								0	22	<25
14 259.6	1.200	1,*g*								1	22	<25
14 259.7	1.193	1,*g*	0	1	1	0	0	13	1	2	21	37
14 259.8	1.159	0,g^+								4	22	<25
14 260.2	1.176	1,*g*								3	22	<25
14 260.5	1.173	1,*u*								3	22	<25
14 260.5	1.164	0,u^+								4	22	<25
14 260.6	1.187	2,*g*								2	22	<25
14 260.8	1.189	0,u^+								2	22	<25
14 260.8	1.187	0,u^-								2	22	<25
14 260.8	1.187	0,g^+								2	22	<25
14 260.8	1.163	0,u^-	1	1	2	1	−1	3	1	4	22	32
14 260.9	1.187	2,*u*								2	22	<25
14 261.6	1.190	1,*u*								2	21	<25
14 262.4	1.201	1,*g*								1	22	<25
14 262.8	1.187	0,g^+								2	22	<25
14 263.8	1.187	2,*g*								2	22	<25
14 263.9	1.187	0,g^-								2	22	<25
14 264.0	1.200	1,*u*								1	22	<25
14 264.0	1.168	0,g^+	0	4	0	4	4	6	−4	4	22	40
14 264.2	1.215	1,*u*								0	21	<25
14 264.5	1.203	0,g^-								1	21	<25
14 264.7	1.173	1,*u*								3	22	<25
14 264.8	1.214	2,*g*								0	20	<25
14 264.8	1.214	2,*u*								0	20	<25
14 264.8	1.215	1,*g*								0	21	<25
14 265.8	1.164	0,g^-	1	3	0	4	−4	4	4	4	22	52
14 266.1	1.203	0,u^+								1	21	<25
14 267.4	1.177	1,*u*								3	22	<25
14 267.7	1.188	2,*u*								2	22	<25
14 267.9	1.149	1,*u*	2	2	1	1	1	0	0	5	22	33
14 268.2	1.161	0,u^+								4	22	<25
14 268.7	1.187	0,u^+								2	22	<25
14 268.8	1.218	1,*u*	0	0	0	0	0	21	1	0	21	46

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 268.9	1.165	2,g								4	22	<25
14 269.5	1.175	1,g								3	22	<25
14 269.7	1.187	2,g								2	22	<25
14 269.7	1.164	2,u								4	22	<25
14 270.2	1.188	2,u								2	22	<25
14 270.8	1.163	0,g^-	1	2	1	3	−3	3	3	4	22	26
14 270.9	1.163	2,u								4	22	<25
14 270.9	1.201	1,u								1	22	<25
14 271.0	1.201	1,g								1	22	<25
14 271.0	1.140	0,g^+	0	4	2	0	0	0	0	6	22	78
14 271.4	1.188	2,g								2	22	<25
14 271.4	1.187	0,u^-								2	22	<25
14 272.0	1.203	0,u^-								1	21	<25
14 272.8	1.146	2,u	1	5	0	1	1	1	1	6	22	38
		2,u	0	6	0	1	1	3	1	6	22	37
14 273.1	1.183	0,g^+	1	2	0	0	0	10	0	3	21	30
		0,g^+	0	3	0	0	0	12	0	3	21	59
14 273.3	1.166	2,g								4	22	<25
14 273.3	1.144	0,u^-	1	5	0	1	−1	1	1	6	22	78
14 274.0	1.189	0,g^+								2	22	<25
14 274.4	1.188	0,u^-								2	22	<25
14 274.5	1.176	1,g								3	22	<25
14 275.0	1.186	0,u^+								2	22	<25
14 275.2	1.215	2,g								0	22	<25
14 275.4	1.159	2,g	3	0	1	1	1	1	1	4	22	27
14 275.5	1.145	0,u^+	1	5	0	1	1	1	−1	6	22	30
		0,u^+	0	6	0	1	1	3	−1	6	22	56
14 276.2	1.188	2,u								2	22	<25
14 276.4	1.155	1,g	0	4	1	2	2	3	−1	5	22	27
		1,g	0	4	1	2	−2	3	3	5	22	28
14 276.6	1.215	2,u								0	22	<25
14 276.6	1.200	1,u								1	22	<25
14 276.7	1.172	1,g								3	22	<25
14 276.9	1.188	2,g								2	22	<25
14 276.9	1.176	1,g								3	22	<25
14 277.2	1.153	1,u								5	22	<25
14 277.2	1.186	0,g^+								2	22	<25
14 277.5	1.187	0,g^-								2	22	<25
14 278.1	1.215	2,g								0	22	<25
14 278.2	1.203	2,g								1	21	<25
14 278.9	1.160	2,g								4	22	<25
14 279.1	1.177	1,u								3	22	<25
14 279.2	1.203	2,u								1	21	<25
14 279.2	1.200	1,g								1	22	<25
14 279.4	1.194	1,u	0	2	0	0	0	15	1	2	21	42
14 279.4	1.215	0,u^-								0	22	<25
14 279.4	1.215	0,g^-								0	22	<25
14 279.4	1.188	0,g^+								2	22	<25
14 280.1	1.162	0,g^-	2	2	0	4	−2	2	2	4	22	39
14 280.3	1.176	1,g								3	22	<25
14 280.4	1.188	0,u^-								2	22	<25
14 280.7	1.188	2,u								2	22	<25
14 281.3	1.165	0,u^-								4	22	<25
14 281.5	1.201	1,u								1	22	<25
14 282.1	1.175	1,u								3	22	<25
14 282.1	1.203	2,u								1	21	<25
14 282.6	1.186	2,g								2	22	<25
14 282.6	1.166	0,u^-	0	4	0	5	−1	5	1	4	22	34
14 283.5	1.161	2,u								4	22	<25
14 283.5	1.165	0,u^+								4	22	<25
14 283.7	1.200	1,g								1	22	<25
14 283.8	1.187	0,g^+								2	22	<25
14 283.9	1.165	0,g^+								4	22	<25
14 284.4	1.175	1,u								3	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 284.5	1.187	2,*u*								2	22	<25
14 284.8	1.188	0,u^+								2	22	<25
14 285.0	1.202	1,*g*								1	22	<25
14 285.2	1.155	0,g^-	3	0	1	1	−1	1	1	4	22	70
14 285.5	1.175	1,*g*								3	22	<25
14 286.1	1.183	2,*g*	1	2	0	0	0	10	2	3	21	30
		2,*g*	0	3	0	0	0	12	2	3	21	59
14 287.1	1.172	1,*g*								3	22	<25
14 287.2	1.201	1,*u*								1	22	<25
14 287.2	1.188	0,g^-								2	22	<25
14 287.3	1.199	1,*g*								1	22	<25
14 287.5	1.164	2,*g*								4	22	<25
14 287.5	1.188	0,u^+	1	1	0	7	7	7	−7	2	22	40
14 287.8	1.173	1,*u*								3	22	<25
14 288.3	1.215	0,u^-	0	0	0	11	−11	11	11	0	22	38
14 288.6	1.188	2,*g*								2	22	<25
14 288.9	1.189	0,g^-								2	22	<25
14 289.0	1.169	2,*u*								4	22	<25
14 289.3	1.188	0,u^-								2	22	<25
14 289.4	1.215	0,g^-	0	0	0	12	−10	10	10	0	22	28
14 290.4	1.188	2,*u*								2	22	<25
14 290.5	1.201	1,*g*								1	22	<25
14 290.7	1.187	2,*g*								2	22	<25
14 291.0	1.165	0,g^+	1	3	0	4	4	4	−4	4	22	25
14 291.1	1.187	2,*u*								2	22	<25
14 291.4	1.145	2,*u*	1	5	0	1	1	1	1	6	22	47
		2,*u*	0	6	0	1	−1	3	3	6	22	49
14 291.4	1.162	0,u^-								4	22	<25
14 291.5	1.216	2,*u*								0	22	<25
14 291.6	1.204	0,g^+								1	21	<25
14 292.2	1.204	0,u^-								1	21	<25
14 292.5	1.200	1,*u*								1	22	<25
14 292.5	1.187	0,g^-								2	22	<25
14 293.0	1.175	1,*u*								3	22	<25
14 293.2	1.188	2,*g*								2	22	<25
14 293.3	1.187	0,u^-	2	0	0	7	−5	5	5	2	22	30
14 293.9	1.189	0,u^+								2	22	<25
14 294.1	1.217	2,*g*								0	22	<25
14 294.4	1.176	1,*u*								3	22	<25
14 295.5	1.165	2,*u*								4	22	<25
14 295.8	1.188	2,*g*								2	22	<25
14 296.0	1.216	2,*u*								0	22	<25
14 296.2	1.188	2,*u*								2	22	<25
14 296.3	1.175	1,*u*								3	22	<25
14 296.7	1.201	1,*u*								1	22	<25
14 296.9	1.165	2,*g*								4	22	<25
14 297.3	1.204	2,*g*								1	21	<25
14 297.6	1.175	1,*g*	2	1	0	5	5	4	−4	3	22	35
14 298.4	1.165	2,*u*								4	22	<25
14 298.5	1.204	2,*u*								1	21	<25
14 298.5	1.187	0,u^-								2	22	<25
14 299.1	1.188	2,*u*								2	22	<25
14 299.3	1.200	1,*u*								1	22	<25
14 299.8	1.146	0,u^-	0	6	0	1	−1	3	1	6	22	78
14 300.0	1.140	0,u^+	1	4	1	0	0	0	0	6	22	79
14 300.1	1.187	2,*g*								2	22	<25
14 300.1	1.166	0,u^+	0	3	1	4	2	4	−2	4	22	27
		0,u^+	0	3	1	4	0	4	0	4	22	30
14 300.2	1.201	1,*g*								1	22	<25
14 300.5	1.217	0,u^-								0	22	<25
14 300.5	1.217	0,g^-								0	22	<25
14 300.6	1.188	2,*g*								2	22	<25
14 300.8	1.188	2,*u*								2	22	<25
14 300.9	1.172	1,*g*								3	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 301.4	1.186	$0,g^+$								2	22	<25
14 301.5	1.188	$0,g^-$								2	22	<25
14 301.7	1.156	$0,g^+$	0	0	4	0	0	2	0	4	22	40
14 301.9	1.178	$1,u$								3	22	<25
14 302.9	1.186	$0,u^+$								2	22	<25
14 303.0	1.188	$2,u$								2	22	<25
14 303.3	1.200	$1,g$								1	22	<25
14 304.2	1.161	$0,g^+$	2	2	0	4	0	2	0	4	22	42
14 304.3	1.200	$1,g$								1	22	<25
14 304.6	1.165	$2,g$								4	22	<25
14 305.2	1.201	$1,u$								1	22	<25
14 305.2	1.175	$1,g$								3	22	<25
14 305.5	1.187	$2,u$								2	22	<25
14 305.6	1.153	$1,u$								5	22	<25
14 306.3	1.165	$0,g^-$	1	2	1	3	−1	3	1	4	22	38
14 307.0	1.192	$1,g$								2	21	<25
14 307.0	1.177	$1,u$								3	22	<25
14 307.4	1.187	$0,g^+$								2	22	<25
14 307.5	1.188	$2,g$								2	22	<25
14 307.5	1.188	$0,u^-$								2	22	<25
14 307.6	1.216	$1,u$								0	21	<25
14 307.6	1.215	$0,u^+$	0	0	0	11	11	11	−11	0	22	58
14 307.8	1.187	$0,g^+$								2	22	<25
14 308.0	1.216	$1,g$								0	21	<25
14 308.1	1.206	$0,g^+$	0	1	0	0	0	18	0	1	21	33
14 308.4	1.155	$1,u$								5	22	<25
14 308.7	1.147	$2,u$	0	6	0	1	1	3	1	6	22	59
		$2,u$	0	6	0	1	−1	3	3	6	22	27
14 309.2	1.175	$1,g$								3	22	<25
14 309.2	1.159	$0,u^+$								4	22	<25
14 309.3	1.187	$2,g$								2	22	<25
14 309.6	1.163	$2,g$								4	22	<25
14 309.9	1.188	$0,u^+$								2	22	<25
14 310.0	1.187	$2,u$								2	22	<25
14 310.1	1.200	$1,u$								1	22	<25
14 311.4	1.215	$2,g$								0	22	<25
14 311.6	1.200	$1,g$								1	22	<25
14 312.4	1.175	$1,u$								3	22	<25
14 312.8	1.167	$2,u$	0	3	1	4	0	4	2	4	22	33
14 312.8	1.202	$0,g^-$								1	21	<25
14 313.7	1.215	$0,g^+$								0	22	<25
14 313.7	1.189	$0,g^+$								2	22	<25
14 314.0	1.167	$0,g^-$								4	22	<25
14 314.1	1.202	$0,u^+$								1	21	<25
14 314.1	1.189	$0,u^+$								2	22	<25
14 314.3	1.159	$2,u$								4	22	<25
14 315.1	1.188	$2,u$								2	22	<25
14 315.2	1.200	$1,g$								1	22	<25
14 315.3	1.155	$1,g$	0	4	1	2	2	3	−1	5	22	38
		$1,g$	0	4	1	2	0	3	1	5	22	37
14 315.3	1.216	$0,u^+$								0	22	<25
14 315.4	1.216	$0,g^+$								0	22	<25
14 315.4	1.187	$0,u^+$								2	22	<25
14 316.2	1.177	$1,g$								3	22	<25
14 316.3	1.187	$0,g^-$								2	22	<25
14 316.8	1.201	$1,u$								1	22	<25
14 317.2	1.187	$0,g^+$								2	22	<25
14 317.4	1.188	$2,g$								2	22	<25
14 317.6	1.205	$2,g$	0	1	0	0	0	18	2	1	21	25
14 317.7	1.156	$2,g$	0	0	4	0	0	2	2	4	22	36
14 318.1	1.172	$1,u$								3	22	<25
14 318.6	1.187	$2,g$								2	22	<25
14 318.8	1.153	$1,g$	0	3	2	1	1	2	0	5	22	34
		$1,g$	0	4	1	2	0	3	1	5	22	28

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 319.3	1.201	1,u								1	22	<25
14 319.5	1.164	2,g								4	22	<25
14 319.5	1.176	1,g								3	22	<25
14 320.1	1.189	0,u^-								2	22	<25
14 320.6	1.188	2,g								2	22	<25
14 320.8	1.176	1,g								3	22	<25
14 320.8	1.188	0,u^+								2	22	<25
14 321.1	1.215	0,u^-	0	0	0	11	−11	11	11	0	22	42
14 322.2	1.188	2,u								2	22	<25
14 322.6	1.198	1,u								1	22	<25
14 322.7	1.203	2,g								1	21	<25
14 322.8	1.188	2,u								2	22	<25
14 322.8	1.202	2,u								1	21	<25
14 322.9	1.201	1,g								1	22	<25
14 323.0	1.187	0,g^+								2	22	<25
14 323.0	1.171	0,u^+								3	23	<25
14 323.0	1.171	0,g^+								3	23	<25
14 323.9	1.203	0,u^-								1	21	<25
14 323.9	1.188	0,g^-								2	22	<25
14 324.3	1.200	1,u								1	22	<25
14 325.0	1.163	0,u^+	3	1	0	3	1	1	−1	4	22	28
14 325.1	1.176	1,g								3	22	<25
14 325.2	1.165	0,u^-	1	2	1	2	−2	4	2	4	22	26
14 325.5	1.202	1,g								1	22	<25
14 325.8	1.166	$'_{2,g}$								4	22	<25
14 325.8	1.175	1,g								3	22	<25
14 326.3	1.201	1,u								1	22	<25
14 326.4	1.152	1,u	2	3	0	2	2	1	−1	5	22	52
14 326.8	1.176	1,g								3	22	<25
14 326.9	1.159	2,u	3	1	0	3	3	1	−1	4	22	37
14 327.5	1.188	2,u								2	22	<25
14 327.6	1.215	2,u								0	22	<25
14 327.8	1.203	0,g^+								1	21	<25
14 327.9	1.153	1,g	0	3	2	1	−1	2	2	5	22	38
		1,g	0	4	1	2	−2	3	3	5	22	29
14 328.0	1.189	0,g^-								2	22	<25
14 328.1	1.215	0,g^+								0	22	<25
14 328.2	1.187	2,g								2	22	<25
14 328.2	1.215	0,u^+								0	22	<25
14 328.4	1.201	1,g								1	22	<25
14 328.5	1.187	0,g^+								2	22	<25
14 328.6	1.203	0,g^-								1	21	<25
14 328.9	1.168	0,g^-	1	3	0	4	−2	4	2	4	22	26
		0,g^-	0	4	0	4	−2	6	2	4	22	30
14 329.3	1.204	0,u^+								1	21	<25
14 329.5	1.174	1,u								3	22	<25
14 329.9	1.166	0,g^+								4	22	<25
14 330.9	1.188	2,u								2	22	<25
14 331.1	1.171	2,u								3	23	<25
14 331.1	1.187	2,g								2	22	<25
14 331.1	1.171	2,g								3	23	<25
14 331.2	1.187	0,u^+								2	22	<25
14 332.0	1.161	0,u^+	3	1	0	3	1	1	−1	4	22	29
14 332.6	1.215	2,u								0	22	<25
14 332.6	1.189	0,u^-								2	22	<25
14 332.8	1.193	1,u	1	1	0	0	0	13	1	2	21	35
14 332.9	1.151	1,u	2	3	0	2	0	1	1	5	22	61
14 332.9	1.201	1,g								1	22	<25
14 333.3	1.215	2,g								0	22	<25
14 333.4	1.189	0,g^+								2	22	<25
14 333.5	1.202	1,u								1	22	<25
14 333.9	1.174	1,u								3	22	<25
14 334.7	1.173	1,g								3	22	<25
14 334.9	1.188	2,g								2	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 335.0	1.188	2,u								2	22	<25
14 335.1	1.203	2,u								1	21	<25
14 335.1	1.167	2,g								4	22	<25
14 335.2	1.201	1,u								1	22	<25
14 335.9	1.201	1,g								1	22	<25
14 336.2	1.215	0,g^-								0	22	<25
14 336.5	1.187	2,u								2	22	<25
14 336.9	1.188	0,u^+								2	22	<25
14 337.0	1.174	1,u								3	22	<25
14 337.0	1.188	0,g^-								2	22	<25
14 337.4	1.215	0,u^+								0	22	<25
14 337.9	1.173	1,g								3	22	<25
14 338.7	1.188	2,g								2	22	<25
14 338.8	1.200	1,u								1	22	<25
14 338.9	1.204	2,g								1	21	<25
14 339.6	1.200	1,u								1	22	<25
14 339.7	1.188	0,u^-								2	22	<25
14 339.9	1.173	1,u								3	22	<25
14 340.0	1.187	2,g								2	22	<25
14 340.0	1.189	0,g^+								2	22	<25
14 340.5	1.176	1,u								3	22	<25
14 340.6	1.157	0,u^-	3	1	0	3	−1	1	1	4	22	71
14 340.7	1.176	1,g								3	22	<25
14 340.7	1.164	2,u								4	22	<25
14 340.8	1.155	1,u	1	3	1	1	1	2	0	5	22	31
14 340.8	1.203	2,u								1	21	<25
14 341.0	1.203	2,g								1	21	<25
14 341.6	1.189	2,u								2	22	<25
14 343.0	1.166	2,u								4	22	<25
14 343.4	1.201	1,g								1	22	<25
14 343.4	1.189	2,g								2	22	<25
14 343.6	1.175	1,u								3	22	<25
14 344.6	1.201	1,g								1	22	<25
14 345.1	1.177	1,u								3	22	<25
14 345.2	1.167	2,g								4	22	<25
14 346.4	1.177	1,u								3	22	<25
14 346.9	1.153	1,u	1	3	1	1	−1	2	2	5	22	28
14 347.1	1.188	2,u								2	22	<25
14 347.2	1.215	2,g								0	22	<25
14 347.9	1.188	0,u^-								2	22	<25
14 348.5	1.177	1,g								3	22	<25
14 348.8	1.188	2,g								2	22	<25
14 349.1	1.200	1,u								1	22	<25
14 349.4	1.188	2,u								2	22	<25
14 350.4	1.200	1,g								1	22	<25
14 350.5	1.165	0,g^+	0	3	1	3	1	5	−1	4	22	26
14 350.6	1.189	0,g^+								2	22	<25
14 350.7	1.189	2,g								2	22	<25
14 351.3	1.190	0,u^+								2	22	<25
14 352.6	1.175	1,g								3	22	<25
14 352.8	1.158	2,u	3	1	0	3	1	1	1	4	22	53
14 353.1	1.162	0,u^+								4	22	<25
14 353.5	1.201	1,u								1	22	<25
14 354.6	1.217	0,u^+								0	22	<25
14 354.7	1.217	0,g^+								0	22	<25
14 355.2	1.187	0,g^+								2	22	<25
14 355.5	1.201	1,g								1	22	<25
14 356.5	1.162	0,g^+								4	22	<25
14 356.8	1.156	1,g	2	0	2	3	1	0	0	4	23	43
14 356.9	1.187	0,u^-								2	22	<25
14 357.3	1.188	0,g^-								2	22	<25
14 357.4	1.156	1,u	1	0	3	3	1	0	0	4	23	48
14 358.1	1.154	0,g^+	4	0	0	2	0	0	0	4	22	68
14 358.3	1.187	2,u								2	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 358.7	1.215	2,*u*								0	22	<25
14 358.8	1.202	1,*g*								1	22	<25
14 358.9	1.152	2,*g*	4	0	0	2	2	0	0	4	22	81
14 358.9	1.201	1,*u*								1	22	<25
14 359.3	1.188	2,*u*								2	22	<25
14 359.3	1.214	$0,g^+$								0	22	<25
14 359.3	1.190	$0,u^+$								2	22	<25
14 359.4	1.214	$0,u^-$								0	22	<25
14 360.1	1.155	1,*u*	1	4	0	2	2	3	−1	5	22	31
		1,*u*	1	4	0	2	0	3	1	5	22	32
14 360.3	1.188	2,*g*								2	22	<25
14 360.8	1.202	1,*u*								1	22	<25
14 360.9	1.154	1,*u*	1	4	0	2	−2	3	3	5	22	35
14 360.9	1.188	$0,u^+$								2	22	<25
14 360.9	1.156	$0,g^+$	0	5	0	8	0	0	0	5	23	83
14 361.3	1.215	2,*g*								0	22	<25
14 361.5	1.188	2,*g*								2	22	<25
14 361.7	1.186	$0,g^-$								2	22	<25
14 362.1	1.162	$0,u^+$								4	22	<25
14 362.6	1.216	1,*g*								0	21	<25
14 363.0	1.202	1,*u*								1	22	<25
14 363.6	1.175	1,*u*								3	22	<25
14 363.8	1.216	1,*u*								0	21	<25
14 363.8	1.215	2,*u*								0	22	<25
14 364.1	1.165	$0,u^-$	2	2	0	3	−3	3	3	4	22	40
14 364.2	1.190	2,*u*								2	22	<25
14 364.4	1.178	1,*g*								3	22	<25
14 364.9	1.156	2,*g*	0	5	0	8	2	0	0	5	23	84
14 365.2	1.187	$0,u^-$								2	22	<25
14 365.2	1.188	$0,g^+$								2	22	<25
14 365.3	1.165	2,*g*								4	22	<25
14 365.5	1.163	$0,g^+$								4	22	<25
14 365.6	1.173	1,*u*								3	22	<25
14 365.9	1.172	1,*g*								3	22	<25
14 366.6	1.215	2,*u*								0	22	<25
14 366.9	1.189	$0,g^-$								2	22	<25
14 367.4	1.188	2,*g*								2	22	<25
14 367.4	1.165	2,*g*	1	3	0	4	0	4	2	4	22	25
14 368.5	1.163	2,*u*								4	22	<25
14 368.6	1.176	1,*u*								3	22	<25
14 368.7	1.189	$0,u^+$								2	22	<25
14 369.5	1.202	1,*g*								1	22	<25
14 369.9	1.166	$0,g^-$	0	2	2	2	−2	4	2	4	22	32
		$0,g^-$	0	3	1	3	−3	5	3	4	22	40
14 370.3	1.173	1,*u*								3	22	<25
14 370.4	1.187	2,*g*								2	22	<25
14 370.4	1.188	$0,g^+$								2	22	<25
14 370.7	1.189	2,*u*								2	22	<25
14 371.2	1.215	$0,g^-$								0	22	<25
14 372.3	1.202	1,*g*								1	22	<25
14 372.5	1.215	$0,u^-$								0	22	<25
14 372.8	1.163	$0,u^+$								4	22	<25
14 373.2	1.177	1,*g*								3	22	<25
14 373.6	1.188	2,*u*								2	22	<25
14 373.7	1.165	$0,u^-$	1	2	1	2	−2	4	2	4	22	39
14 373.9	1.188	$0,g^+$								2	22	<25
14 374.6	1.175	1,*u*								3	22	<25
14 374.9	1.186	1,*u*								2	23	<25
14 374.9	1.186	1,*g*								2	23	<25
14 375.7	1.215	2,*g*								0	22	<25
14 375.7	1.175	1,*g*								3	22	<25
14 376.0	1.201	1,*u*								1	22	<25
14 376.0	1.187	$0,u^-$								2	22	<25
14 376.1	1.201	1,*g*								1	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 376.4	1.175	1,u								3	22	<25
14 376.5	1.187	2,g								2	22	<25
14 376.7	1.176	1,g								3	22	<25
14 377.3	1.164	2,u	2	2	0	3	3	3	−1	4	22	30
14 377.3	1.188	2,u								2	22	<25
14 377.6	1.200	1,g								1	22	<25
14 377.8	1.188	2,g								2	22	<25
14 377.8	1.188	$0,g^-$								2	22	<25
14 377.9	1.166	$0,u^+$	1	3	0	3	3	5	−3	4	22	27
		$0,u^+$	1	3	0	3	1	5	−1	4	22	34
14 378.8	1.162	2,g	1	1	2	0	0	4	2	4	22	32
14 379.1	1.190	$0,u^+$								2	22	<25
14 379.3	1.176	1,g								3	22	<25
14 379.8	1.188	2,u								2	22	<25
14 380.7	1.195	1,g								2	21	<25
14 380.8	1.187	$0,u^-$								2	22	<25
14 381.0	1.215	2,g								0	22	<25
14 381.4	1.189	2,g								2	22	<25
14 381.7	1.188	2,u								2	22	<25
14 381.8	1.178	1,g								3	22	<25
14 382.1	1.188	$0,u^+$								2	22	<25
14 382.3	1.166	2,u								4	22	<25
14 383.5	1.215	1,g								0	21	<25
14 383.5	1.215	1,u								0	21	<25
14 383.8	1.202	1,u								1	22	<25
14 384.7	1.166	2,g	0	3	1	3	−3	5	5	4	22	25
14 384.8	1.204	$0,u^-$								1	21	<25
14 384.9	1.190	$0,g^+$								2	22	<25
14 385.2	1.189	2,g								2	22	<25
14 385.3	1.163	2,u								4	22	<25
14 385.4	1.217	2,u								0	22	<25
14 385.5	1.217	2,g								0	22	<25
14 385.6	1.195	1,u								2	21	<25
14 386.1	1.188	2,u								2	22	<25
14 386.2	1.203	1,g								1	22	<25
14 386.6	1.146	1,g	0	6	0	5	1	0	0	6	23	97
14 387.0	1.161	$0,g^+$	1	1	2	0	0	4	0	4	22	27
14 387.8	1.203	1,u								1	22	<25
14 389.4	1.205	$0,g^+$								1	21	<25
14 389.4	1.190	$0,g^-$								2	22	<25
14 389.6	1.190	$0,u^-$								2	22	<25
14 389.7	1.172	1,u								3	22	<25
14 390.1	1.201	1,g								1	22	<25
14 390.2	1.188	2,u								2	22	<25
14 390.2	1.188	$0,g^+$								2	22	<25
14 390.4	1.189	$0,u^+$								2	22	<25
14 390.8	1.188	2,g								2	22	<25
14 393.5	1.163	$0,u^+$								4	22	<25
14 393.7	1.166	2,u								4	22	<25
14 393.7	1.179	1,g								3	22	<25
14 394.0	1.201	1,u								1	22	<25
14 394.3	1.215	2,u								0	22	<25
14 394.5	1.189	2,g								2	22	<25
14 394.6	1.188	$0,g^-$								2	22	<25
14 394.8	1.204	2,u								1	21	<25
14 394.8	1.201	1,g								1	22	<25
14 395.2	1.189	2,u								2	22	<25
14 395.2	1.170	$0,g^+$	0	4	0	4	2	6	−2	4	22	32
		$0,g^+$	0	4	0	4	0	6	0	4	22	25
14 395.4	1.159	1,u	0	5	0	2	0	5	1	5	22	49
14 396.3	1.175	1,u								3	22	<25
14 397.0	1.177	1,u								3	22	<25
14 397.0	1.147	1,g	3	2	0	1	1	0	0	5	22	45
14 397.2	1.215	2,u								0	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 397.4	1.201	1,*u*								1	22	<25
14 397.4	1.189	0,u^-								2	22	<25
14 397.7	1.165	0,g^+								4	22	<25
14 397.9	1.215	2,*g*								0	22	<25
14 398.5	1.190	2,*g*								2	22	<25
14 398.6	1.216	0,g^+	0	0	0	10	10	12	−10	0	22	27
14 398.7	1.215	2,*u*								0	22	<25
14 398.9	1.189	2,*u*								2	22	<25
14 399.4	1.155	0,u^+	3	0	1	0	0	2	0	4	22	67
14 399.5	1.187	0,g^-								2	22	<25
14 399.6	1.189	2,*g*								2	22	<25
14 399.8	1.205	2,*g*								1	21	<25
14 400.1	1.201	1,*g*								1	22	<25
14 400.8	1.144	0,u^+	0	5	1	0	0	2	0	6	22	97
14 401.4	1.176	1,*g*								3	22	<25
14 401.7	1.166	2,*g*								4	22	<25
14 402.1	1.167	0,u^-	1	3	0	3	−3	5	3	4	22	55
14 402.9	1.164	1,*g*								4	23	<25
14 403.1	1.201	1,*u*								1	22	<25
14 403.1	1.177	1,*u*								3	22	<25
14 403.8	1.167	2,*g*								4	22	<25
14 403.9	1.216	2,*g*	0	0	0	10	−10	12	12	0	22	42
14 404.0	1.201	1,*g*								1	22	<25
14 404.0	1.190	0,g^+								2	22	<25
14 404.5	1.175	1,*g*								3	22	<25
14 404.5	1.164	1,*u*								4	23	<25
14 404.7	1.163	2,*u*	2	2	0	3	−1	3	3	4	22	28
14 405.1	1.189	0,g^-								2	22	<25
14 405.9	1.189	2,*u*								2	22	<25
14 406.3	1.174	1,*g*								3	22	<25
14 406.4	1.215	0,u^+								0	22	<25
14 406.7	1.188	2,*g*								2	22	<25
14 406.8	1.177	1,*u*								3	22	<25
14 407.1	1.215	1,*g*								0	21	<25
14 407.1	1.215	1,*u*								0	21	<25
14 407.2	1.189	0,g^+								2	22	<25
14 407.8	1.201	1,*u*								1	22	<25
14 408.6	1.188	0,u^+								2	22	<25
14 409.1	1.177	1,*u*								3	22	<25
14 409.3	1.189	2,*g*								2	22	<25
14 409.6	1.202	1,*g*								1	22	<25
14 409.8	1.189	2,*u*								2	22	<25
14 409.9	1.160	0,g^-	3	1	0	2	−2	2	2	4	22	27
14 410.0	1.163	2,*g*								4	22	<25
14 410.3	1.157	0,u^+	0	5	0	7	1	1	−1	5	23	76
14 410.4	1.189	2,*g*								2	22	<25
14 411.4	1.177	1,*u*								3	22	<25
14 411.6	1.189	0,u^-								2	22	<25
14 412.7	1.203	1,*u*								1	22	<25
14 412.8	1.178	1,*g*								3	22	<25
14 413.3	1.156	2,*u*	3	0	1	0	0	2	2	4	22	66
14 413.6	1.157	2,*u*	0	5	0	7	3	1	−1	5	23	54
14 413.9	1.162	0,u^-	2	2	0	3	−1	3	1	4	22	63
14 414.2	1.216	2,*g*								0	22	<25
14 414.4	1.190	0,u^+								2	22	<25
14 414.5	1.144	2,*u*	0	5	1	0	0	2	2	6	22	97
14 414.7	1.166	2,*u*	1	3	0	3	−3	5	5	4	22	33
14 414.8	1.202	1,*g*								1	22	<25
14 415.1	1.166	0,g^-	0	3	1	3	−1	5	1	4	22	51
14 415.5	1.155	1,*u*	0	4	1	1	1	4	0	5	22	29
		1,*u*	0	4	1	1	−1	4	2	5	22	32
14 416.0	1.166	0,u^+	1	2	1	2	0	4	0	4	22	36
14 416.1	1.201	1,*u*								1	22	<25
14 416.7	1.190	2,*g*								2	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 417.5	1.187	$0,u^-$	2	0	0	5	−5	7	5	2	22	26
14 417.9	1.147	$1,g$	3	2	0	1	1	0	0	5	22	43
14 418.0	1.172	$0,u^+$								3	23	<25
14 418.4	1.189	$2,u$								2	22	<25
14 418.4	1.165	$0,g^+$								4	22	<25
14 418.7	1.172	$0,g^+$	1	0	2	8	0	0	0	3	23	32
14 418.9	1.177	$1,u$								3	22	<25
14 418.9	1.215	$0,g^-$	0	0	0	10	−10	12	10	0	22	25
14 419.0	1.203	$0,u^+$								1	21	<25
14 419.0	1.203	$0,g^-$								1	21	<25
14 420.0	1.167	$0,u^+$								4	22	<25
14 420.1	1.188	$0,g^+$								2	22	<25
14 420.6	1.216	$0,u^-$								0	22	<25
14 421.7	1.216	$0,g^-$								0	22	<25
14 423.0	1.164	$2,u$								4	22	<25
14 423.2	1.189	$2,g$								2	22	<25
14 423.7	1.140	$0,g^+$	2	4	0	0	0	0	0	6	22	66
14 424.1	1.188	$2,u$								2	22	<25
14 424.1	1.188	$0,u^+$								2	22	<25
14 424.6	1.203	$2,g$								1	21	<25
14 424.6	1.203	$2,u$								1	21	<25
14 424.9	1.170	$1,u$	3	0	0	4	0	3	1	3	22	34
14 425.3	1.172	$0,g^-$								3	23	<25
14 425.4	1.172	$0,u^-$								3	23	<25
14 425.6	1.189	$2,u$								2	22	<25
14 425.8	1.172	$2,u$								3	23	<25
14 426.1	1.201	$1,u$								1	22	<25
14 426.3	1.164	$2,g$								4	22	<25
14 426.5	1.172	$2,g$	1	0	2	8	2	0	0	3	23	32
14 426.6	1.217	$2,u$								0	22	<25
14 426.9	1.201	$1,g$								1	22	<25
14 427.7	1.201	$1,u$								1	22	<25
14 427.8	1.174	$0,g^+$								3	23	<25
14 427.9	1.174	$0,u^+$								3	23	<25
14 428.2	1.164	$2,g$								4	22	<25
14 428.4	1.187	$0,g^+$								2	22	<25
14 428.5	1.202	$1,g$								1	22	<25
14 428.5	1.188	$2,g$								2	22	<25
14 428.9	1.173	$1,g$								3	22	<25
14 429.1	1.217	$2,g$								0	22	<25
14 429.6	1.165	$2,u$								4	22	<25
14 430.6	1.189	$2,u$								2	22	<25
14 431.0	1.189	$0,g^-$								2	22	<25
14 431.1	1.190	$0,u^-$								2	22	<25
14 431.5	1.189	$2,g$								2	22	<25
14 431.5	1.203	$1,u$								1	22	<25
14 431.9	1.177	$1,g$								3	22	<25
14 432.1	1.188	$2,u$								2	22	<25
14 432.7	1.188	$0,u^+$								2	22	<25
14 433.0	1.172	$2,g$								3	23	<25
14 433.1	1.172	$2,u$								3	23	<25
14 433.3	1.159	$0,g^+$	3	1	0	2	2	2	−2	4	22	47
14 433.7	1.188	$0,u^-$								2	22	<25
14 433.7	1.189	$0,g^-$								2	22	<25
14 434.0	1.202	$1,g$								1	22	<25
14 434.3	1.167	$2,u$								4	22	<25
14 434.6	1.177	$1,u$								3	22	<25
14 434.7	1.174	$2,g$								3	23	<25
14 434.7	1.165	$2,g$								4	22	<25
14 434.8	1.174	$2,u$								3	23	<25
14 434.9	1.178	$1,g$								3	22	<25
14 435.2	1.202	$1,u$								1	22	<25
14 435.3	1.153	$1,g$								5	22	<25
14 436.5	1.187	$0,u^+$								2	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 436.7	1.171	1,g								3	22	<25
14 437.3	1.176	1,u								3	22	<25
14 437.6	1.190	2,u								2	22	<25
14 438.9	1.216	2,u								0	22	<25
14 439.1	1.203	1,g								1	22	<25
14 439.2	1.178	1,u								3	22	<25
14 439.3	1.159	0,g^-	3	1	0	2	−2	2	2	4	22	50
14 439.7	1.215	0,u^-								0	22	<25
14 441.1	1.215	0,g^+								0	22	<25
14 442.0	1.189	2,g								2	22	<25
14 442.2	1.190	0,g^+								2	22	<25
14 442.7	1.188	0,u^-								2	22	<25
14 443.0	1.203	1,g								1	22	<25
14 443.3	1.202	1,u								1	22	<25
14 443.5	1.169	0,u^+	0	4	0	3	3	7	−3	4	22	35
14 443.9	1.215	1,u								0	21	<25
14 443.9	1.215	1,g								0	21	<25
14 444.0	1.187	0,g^+								2	22	<25
14 444.4	1.144	0,g^+	1	5	0	0	0	2	0	6	22	46
		0,g^+	0	6	0	0	0	4	0	6	22	31
14 444.5	1.188	2,u								2	22	<25
14 444.5	1.163	1,g	0	4	0	11	1	0	0	4	23	34
14 445.3	1.214	0,u^+								0	22	<25
14 445.6	1.190	2,u								2	22	<25
14 445.9	1.215	0,g^+								0	22	<25
14 446.2	1.202	0,u^+								1	23	<25
14 446.2	1.202	0,g^+								1	23	<25
14 446.7	1.188	2,g								2	22	<25
14 446.7	1.216	0,u^+								0	22	<25
14 447.0	1.189	0,g^-								2	22	<25
14 447.1	1.203	1,u								1	22	<25
14 447.5	1.217	0,u^-								0	22	<25
14 447.5	1.217	0,g^-								0	22	<25
14 447.6	1.167	0,u^-	0	2	2	1	−1	5	1	4	22	29
14 447.7	1.188	2,u								2	22	<25
14 448.1	1.202	1,g								1	22	<25
14 448.7	1.188	2,g								2	22	<25
14 449.1	1.174	1,g								3	22	<25
14 449.9	1.174	1,u	1	0	2	0	0	7	1	3	22	32
14 449.9	1.188	0,g^+								2	22	<25
14 450.4	1.215	2,g								0	22	<25
14 450.6	1.215	0,g^+								0	22	<25
14 450.9	1.174	1,g								3	22	<25
14 451.7	1.188	2,u								2	22	<25
14 451.7	1.189	2,g								2	22	<25
14 451.8	1.168	2,u								4	22	<25
14 452.3	1.201	1,g								1	22	<25
14 452.6	1.158	0,g^+	3	1	0	2	0	2	0	4	22	62
14 452.8	1.202	1,u								1	22	<25
14 453.1	1.189	0,u^-								2	22	<25
14 453.6	1.189	0,u^+								2	22	<25
14 453.9	1.191	0,g^-								2	22	<25
14 454.1	1.172	1,g								3	22	<25
14 454.5	1.159	2,g	3	1	0	2	2	2	0	4	22	32
		2,g	2	1	1	1	1	3	1	4	22	27
14 455.5	1.145	2,g	1	5	0	0	0	2	2	6	22	72
		2,g	0	6	0	0	0	4	2	6	22	28
14 455.6	1.156	1,u	0	4	1	1	1	4	0	5	22	58
		1,u	0	4	1	1	−1	4	2	5	22	32
14 455.7	1.162	1,u								4	23	<25
14 457.2	1.189	2,g								2	22	<25
14 457.3	1.179	1,u								3	22	<25
14 458.2	1.200	1,g								1	22	<25
14 458.3	1.187	1,u								2	23	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 458.3	1.187	1,*g*								2	23	<25
14 459.1	1.174	1,*g*	0	0	3	0	0	7	1	3	22	41
14 459.4	1.190	0,g^-								2	22	<25
14 459.9	1.202	2,*u*								1	23	<25
14 459.9	1.202	2,*g*								1	23	<25
14 460.3	1.216	2,*g*								0	22	<25
14 460.4	1.180	1,*g*								3	22	<25
14 460.7	1.189	2,*u*								2	22	<25
14 461.6	1.190	0,u^-								2	22	<25
14 461.7	1.189	0,u^+								2	22	<25
14 462.1	1.204	0,u^+								1	21	<25
14 462.1	1.204	0,g^-								1	21	<25
14 462.4	1.201	1,*u*								1	22	<25
14 462.7	1.157	0,u^-	0	5	0	7	−1	1	1	5	23	86
14 462.9	1.167	2,*u*								4	22	<25
14 462.9	1.190	0,g^+								2	22	<25
14 463.2	1.175	1,*u*								3	22	<25
14 463.5	1.189	2,*g*								2	22	<25
14 463.7	1.202	0,u^-								1	21	<25
14 463.8	1.203	0,g^+								1	21	<25
14 463.9	1.179	1,*u*								3	22	<25
14 464.2	1.191	0,g^+								2	22	<25
14 464.6	1.153	0,u^+	4	0	0	1	1	1	−1	4	22	83
14 465.2	1.215	2,*u*								0	22	<25
14 465.3	1.154	1,*g*	2	3	0	1	−1	2	2	5	22	26
14 465.7	1.190	0,u^+								2	22	<25
14 466.0	1.158	2,*g*	3	1	0	2	0	2	2	4	22	53
14 466.5	1.152	1,*g*	2	3	0	1	1	2	0	5	22	31
		1,*g*	2	3	0	1	−1	2	2	5	22	35
14 466.8	1.168	0,g^+								4	22	<25
14 466.9	1.180	1,*g*								3	22	<25
14 467.1	1.154	1,*u*	0	3	2	0	0	3	1	5	22	59
		1,*u*	0	4	1	1	−1	4	2	5	22	25
14 467.1	1.200	1,*g*								1	22	<25
14 467.5	1.164	1,*g*								4	23	<25
14 467.8	1.157	2,*u*	0	5	0	7	3	1	−1	5	23	30
		2,*u*	0	5	0	7	1	1	1	5	23	56
14 468.3	1.189	2,*u*								2	22	<25
14 468.3	1.190	2,*g*								2	22	<25
14 468.4	1.190	2,*g*								2	22	<25
14 468.6	1.203	1,*u*								1	22	<25
14 468.8	1.167	0,u^-	1	3	0	3	−1	5	1	4	22	42
14 469.0	1.204	2,*g*								1	21	<25
14 469.0	1.204	2,*u*								1	21	<25
14 469.6	1.180	1,*u*								3	22	<25
14 472.7	1.153	0,u^-	4	0	0	1	−1	1	1	4	22	87
14 473.2	1.190	2,*u*								2	22	<25
14 473.2	1.215	0,u^+								0	22	<25
14 473.3	1.202	1,*g*								1	22	<25
14 473.3	1.200	1,*u*								1	22	<25
14 473.5	1.176	1,*g*								3	22	<25
14 473.7	1.165	0,g^-	1	3	0	2	−2	6	2	4	22	26
14 473.9	1.215	0,g^-								0	22	<25
14 474.1	1.203	1,*g*								1	22	<25
14 474.3	1.190	2,*u*								2	22	<25
14 474.4	1.218	0,g^+								0	22	<25
14 474.7	1.190	0,u^+								2	22	<25
14 474.9	1.216	2,*u*								0	22	<25
14 475.0	1.166	0,u^+	0	2	2	1	1	5	−1	4	22	37
14 475.1	1.190	2,*g*								2	22	<25
14 475.2	1.218	0,u^+								0	22	<25
14 475.3	1.203	2,*u*								1	21	<25
14 475.4	1.203	2,*g*								1	21	<25
14 477.1	1.147	0,g^+	1	5	0	0	0	2	0	6	22	33

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,g^+$	0	6	0	0	0	4	0	6	22	66
14 477.3	1.203	$1,u$								1	22	<25
14 477.9	1.158	$1,u$								4	23	<25
14 478.0	1.190	$2,g$								2	22	<25
14 478.0	1.190	$0,u^-$								2	22	<25
14 478.5	1.186	$1,u$								2	23	<25
14 478.5	1.186	$1,g$								2	23	<25
14 478.5	1.188	$0,g^-$								2	22	<25
14 479.1	1.167	$2,u$								4	22	<25
14 479.7	1.189	$2,u$								2	22	<25
14 479.7	1.157	$1,g$	1	0	3	2	2	1	−1	4	23	27
14 479.8	1.179	$1,u$								3	22	<25
14 480.6	1.157	$0,g^+$	0	5	0	6	2	2	−2	5	23	41
		$0,g^+$	0	5	0	6	0	2	0	5	23	27
14 481.3	1.174	$1,g$								3	22	<25
14 481.3	1.190	$0,g^+$								2	22	<25
14 481.5	1.168	$2,g$								4	22	<25
14 482.9	1.190	$0,u^+$								2	22	<25
14 483.2	1.157	$2,g$	0	5	0	6	4	2	−2	5	23	43
14 483.4	1.173	$1,u$	1	0	2	0	0	7	1	3	22	27
14 483.5	1.203	$1,u$								1	22	<25
14 483.9	1.190	$2,u$								2	22	<25
14 484.2	1.153	$2,u$	4	0	0	1	1	1	1	4	22	83
14 484.7	1.154	$1,g$	1	3	1	0	0	3	1	5	22	61
14 484.7	1.173	$1,g$								3	22	<25
14 485.0	1.205	$1,g$								1	22	<25
14 485.2	1.164	$0,g^+$	2	2	0	2	2	4	−2	4	22	28
		$0,g^+$	1	2	1	1	1	5	−1	4	22	40
14 485.7	1.162	$1,u$								4	23	<25
14 487.3	1.165	$2,g$								4	22	<25
14 487.4	1.202	$1,u$								1	22	<25
14 487.6	1.215	$2,g$								0	22	<25
14 488.1	1.147	$2,g$	1	5	0	0	0	2	2	6	22	28
		$2,g$	0	6	0	0	0	4	2	6	22	72
14 488.3	1.179	$1,u$								3	22	<25
14 488.3	1.189	$0,g^+$								2	22	<25
14 488.4	1.158	$1,g$	1	0	3	2	0	1	1	4	23	27
14 488.6	1.203	$1,g$								1	22	<25
14 488.9	1.189	$2,u$								2	22	<25
14 489.6	1.189	$2,g$								2	22	<25
14 490.0	1.166	$2,u$	0	2	2	1	1	5	1	4	22	28
14 490.4	1.163	$1,u$								4	23	<25
14 490.9	1.176	$1,u$								3	22	<25
14 490.9	1.201	$1,u$								1	22	<25
14 492.4	1.190	$2,g$								2	22	<25
14 492.8	1.164	$1,u$								4	23	<25
14 493.0	1.188	$0,u^-$								2	22	<25
14 493.1	1.215	$1,g$								0	21	<25
14 493.1	1.215	$1,u$								0	21	<25
14 493.2	1.215	$2,u$								0	22	<25
14 493.6	1.191	$2,u$								2	22	<25
14 493.8	1.216	$0,u^-$								0	22	<25
14 494.5	1.215	$2,g$								0	22	<25
14 494.9	1.147	$1,u$	0	6	0	4	2	1	−1	6	23	62
		$1,u$	0	6	0	4	0	1	1	6	23	32
14 495.0	1.178	$1,g$								3	22	<25
14 495.6	1.203	$1,g$								1	22	<25
14 496.9	1.188	$0,u^-$								2	22	<25
14 497.3	1.203	$1,u$								1	22	<25
14 499.2	1.215	$2,u$								0	22	<25
14 499.4	1.189	$0,u^+$								2	22	<25
14 499.9	1.156	$1,g$	1	4	0	1	1	4	0	5	22	30
14 500.0	1.165	$1,g$								4	23	<25
14 500.1	1.163	$2,g$								4	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 500.6	1.188	2,u								2	22	<25
14 501.3	1.174	0,u^+								3	23	<25
14 501.8	1.201	1,g								1	22	<25
14 502.3	1.189	2,g								2	22	<25
14 502.4	1.187	0,g^-								2	22	<25
14 502.6	1.216	2,g								0	22	<25
14 502.7	1.178	1,g								3	22	<25
14 503.3	1.189	0,g^+								2	22	<25
14 503.9	1.167	0,u^-	0	2	2	1	−1	5	1	4	22	37
		0,u^-	0	3	1	2	−2	6	2	4	22	46
14 504.0	1.174	0,g^+								3	23	<25
14 504.3	1.202	1,u								1	22	<25
14 504.3	1.190	0,u^+								2	22	<25
14 504.4	1.189	2,g								2	22	<25
14 504.9	1.203	1,g								1	22	<25
14 505.0	1.156	1,g	1	4	0	1	−1	4	2	5	22	30
14 505.9	1.189	2,u								2	22	<25
14 505.9	1.189	0,g^-								2	22	<25
14 506.1	1.189	0,g^+								2	22	<25
14 506.2	1.215	0,u^+								0	22	<25
14 506.4	1.175	2,u								3	23	<25
14 507.3	1.176	0,g^-								3	23	<25
14 507.7	1.176	0,u^-								3	23	<25
14 508.6	1.175	2,g								3	23	<25
14 508.6	1.172	0,g^+								3	23	<25
14 508.7	1.216	0,g^-								0	22	<25
14 508.8	1.164	0,g^-	2	2	0	2	−2	4	2	4	22	51
14 509.2	1.171	0,u^-	0	4	0	3	−1	7	1	4	22	56
14 509.7	1.216	2,u								0	22	<25
14 509.8	1.204	0,u^-								1	21	<25
14 509.9	1.204	0,g^+								1	21	<25
14 510.0	1.172	0,u^+								3	23	<25
14 510.4	1.202	1,u								1	22	<25
14 510.4	1.189	2,u								2	22	<25
14 510.9	1.154	0,u^+	0	4	1	6	0	0	0	5	23	68
14 511.0	1.190	0,u^+								2	22	<25
14 511.2	1.214	0,g^+								0	22	<25
14 511.3	1.215	0,u^-								0	22	<25
14 513.1	1.188	2,g								2	22	<25
14 513.9	1.160	0,u^+	3	1	0	1	1	3	−1	4	22	28
		0,u^+	2	1	1	0	0	4	0	4	22	28
14 514.0	1.168	0,g^+	1	3	0	2	2	6	−2	4	22	35
14 514.1	1.188	0,u^-								2	22	<25
14 514.2	1.191	0,g^+								2	22	<25
14 514.4	1.201	1,g								1	22	<25
14 514.6	1.175	2,u								3	23	<25
14 514.8	1.174	2,g								3	23	<25
14 515.2	1.154	2,u	0	4	1	6	2	0	0	5	23	70
14 515.3	1.170	1,g	3	0	0	3	1	4	0	3	22	33
		1,g	3	0	0	3	−1	4	2	3	22	26
14 515.7	1.168	2,u								4	22	<25
14 516.4	1.203	1,g								1	22	<25
14 516.6	1.188	2,u								2	22	<25
14 516.7	1.216	2,g								0	22	<25
14 516.8	1.189	1,u								2	23	<25
14 516.8	1.189	1,g								2	23	<25
14 517.0	1.216	2,u								0	22	<25
14 517.0	1.173	2,g								3	23	<25
14 517.0	1.189	2,g								2	22	<25
14 517.3	1.202	1,u								1	22	<25
14 517.5	1.188	0,u^-								2	22	<25
14 517.9	1.189	0,g^+								2	22	<25
14 518.1	1.179	1,g								3	22	<25
14 518.6	1.172	2,u								3	23	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 518.9	1.170	2,*u*	0	4	0	3	1	7	1	4	22	26
14 518.9	1.164	1,*u*								4	23	<25
14 518.9	1.190	2,*u*								2	22	<25
14 519.0	1.178	1,*u*								3	22	<25
14 519.6	1.204	2,*u*								1	21	<25
14 519.6	1.187	0,g^-	2	0	0	4	−4	8	4	2	22	29
14 519.8	1.204	2,*g*								1	21	<25
14 520.0	1.202	1,*g*								1	22	<25
14 520.1	1.164	2,*g*	2	2	0	2	−2	4	4	4	22	34
14 520.5	1.175	1,*u*								3	22	<25
14 520.5	1.190	2,*g*								2	22	<25
14 521.2	1.172	0,g^-								3	23	<25
14 521.3	1.176	1,*g*								3	22	<25
14 521.4	1.215	2,*g*								0	22	<25
14 521.6	1.172	0,u^-	1	0	2	7	−1	1	1	3	23	27
14 522.0	1.179	1,*u*								3	22	<25
14 522.1	1.191	0,u^+								2	22	<25
14 522.7	1.158	0,g^-	0	5	0	6	−2	2	2	5	23	81
14 523.3	1.167	0,g^-	1	2	1	1	−1	5	1	4	22	47
		0,g^-	0	4	0	2	−2	8	2	4	22	27
14 523.4	1.189	2,*u*								2	22	<25
14 524.1	1.189	2,*g*								2	22	<25
14 524.1	1.202	0,u^-								1	23	<25
14 524.1	1.202	0,g^-								1	23	<25
14 524.5	1.163	1,*g*								4	23	<25
14 524.6	1.163	0,g^+	2	2	0	2	2	4	−2	4	22	25
		0,g^+	2	2	0	2	0	4	0	4	22	43
14 525.0	1.218	1,*u*								0	23	<25
14 525.0	1.218	1,*g*								0	23	<25
14 526.9	1.158	2,*g*	0	5	0	6	4	2	−2	5	23	35
		2,*g*	0	5	0	6	0	2	2	5	23	34
14 527.0	1.189	2,*u*								2	22	<25
14 527.0	1.168	0,u^+	0	3	1	2	2	6	−2	4	22	36
		0,u^+	0	3	1	2	0	6	0	4	22	42
14 527.5	1.172	2,*g*								3	23	<25
14 527.6	1.172	2,*u*								3	23	<25
14 528.0	1.168	2,*g*								4	22	<25
14 528.3	1.178	1,*g*								3	22	<25
14 528.5	1.191	2,*g*								2	22	<25
14 528.9	1.202	1,*u*								1	22	<25
14 529.2	1.147	1,*u*	0	6	0	4	2	1	−1	6	23	34
		1,*u*	0	6	0	4	0	1	1	6	23	64
14 529.6	1.160	2,*u*	2	1	1	0	0	4	2	4	22	28
14 530.2	1.216	2,*u*								0	22	<25
14 530.3	1.215	2,*g*								0	22	<25
14 530.7	1.178	1,*u*								3	22	<25
14 530.7	1.215	2,*u*								0	22	<25
14 531.1	1.202	1,*u*								1	22	<25
14 531.6	1.174	0,g^+								3	23	<25
14 531.7	1.173	0,u^+								3	23	<25
14 531.8	1.175	1,*u*								3	22	<25
14 532.9	1.203	1,*g*								1	22	<25
14 533.0	1.202	2,*u*								1	23	<25
14 533.0	1.202	2,*g*								1	23	<25
14 533.6	1.174	1,*u*								3	22	<25
14 533.9	1.166	2,*g*								4	22	<25
14 534.3	1.191	2,*u*								2	22	<25
14 534.3	1.192	0,u^-								2	22	<25
14 534.3	1.175	0,u^+								3	23	<25
14 534.5	1.175	0,g^+								3	23	<25
14 535.0	1.202	1,*u*								1	22	<25
14 535.0	1.166	1,*u*								4	23	<25
14 535.4	1.180	1,*g*								3	22	<25
14 535.6	1.188	2,*g*								2	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 535.6	1.215	$0,g^+$								0	22	<25
14 537.1	1.192	$0,g^-$								2	22	<25
14 537.8	1.176	$2,g$								3	23	<25
14 537.9	1.190	$0,u^+$								2	22	<25
14 538.0	1.176	$2,u$								3	23	<25
14 538.5	1.191	$0,g^+$								2	22	<25
14 538.8	1.163	$1,g$	1	1	2	5	1	0	0	4	23	27
14 538.9	1.164	$2,g$	2	2	0	2	0	4	2	4	22	25
14 539.6	1.159	$1,g$	0	5	0	1	1	6	0	5	22	38
		$1,g$	0	5	0	1	−1	6	2	5	22	33
14 540.6	1.173	$2,u$								3	23	<25
14 540.7	1.168	$2,u$	0	3	1	2	0	6	2	4	22	39
14 541.1	1.173	$2,g$								3	23	<25
14 541.6	1.178	$1,g$								3	22	<25
14 541.6	1.217	$2,g$								0	22	<25
14 541.8	1.203	$1,u$								1	22	<25
14 542.1	1.203	$1,g$								1	22	<25
14 542.3	1.215	$0,g^+$								0	22	<25
14 543.0	1.153	$0,g^+$	1	4	0	6	0	0	0	5	23	36
14 544.1	1.187	$1,u$								2	23	<25
14 544.1	1.187	$1,g$								2	23	<25
14 545.5	1.191	$2,u$								2	22	<25
14 546.3	1.191	$2,g$								2	22	<25
14 547.0	1.172	$1,u$								3	22	<25
14 547.5	1.203	$1,g$								1	22	<25
14 548.2	1.176	$1,g$								3	22	<25
14 548.6	1.154	$2,g$	1	4	0	6	2	0	0	5	23	39
14 548.8	1.163	$1,u$								4	23	<25
14 548.8	1.191	$0,u^-$								2	22	<25
14 549.2	1.136	$0,g^+$	0	7	0	2	0	0	0	7	23	100
14 549.6	1.191	$0,g^-$								2	22	<25
14 550.2	1.215	$0,u^-$								0	22	<25
14 551.1	1.191	$2,u$								2	22	<25
14 551.4	1.188	$0,g^+$								2	22	<25
14 551.5	1.191	$2,g$								2	22	<25
14 552.0	1.216	$0,g^-$								0	22	<25
14 552.3	1.146	$1,u$	3	2	0	0	0	1	1	5	22	85
14 552.4	1.201	$1,u$								1	22	<25
14 552.5	1.136	$2,g$	0	7	0	2	2	0	0	7	23	100
14 553.0	1.202	$1,g$								1	22	<25
14 553.8	1.214	$2,u$								0	22	<25
14 553.8	1.189	$0,g^-$								2	22	<25
14 554.9	1.187	$1,g$								2	23	<25
14 554.9	1.187	$1,u$								2	23	<25
14 556.4	1.216	$0,u^-$								0	22	<25
14 557.0	1.169	$0,g^-$	1	3	0	2	−2	6	2	4	22	43
		$0,g^-$	0	4	0	2	−2	8	2	4	22	45
14 557.2	1.215	$0,u^+$								0	22	<25
14 557.3	1.182	$1,u$								3	22	<25
14 557.6	1.160	$0,u^+$	3	1	0	1	1	3	−1	4	22	55
14 557.7	1.189	$2,g$								2	22	<25
14 558.8	1.190	$0,u^-$								2	22	<25
14 559.0	1.163	$1,g$								4	23	<25
14 559.9	1.190	$2,g$								2	22	<25
14 560.1	1.190	$2,u$								2	22	<25
14 560.1	1.189	$0,u^+$	2	0	0	3	1	9	−1	2	22	30
14 560.1	1.175	$0,g^+$								3	23	<25
14 560.3	1.167	$0,g^+$	0	2	2	0	0	6	0	4	22	31
		$0,g^+$	0	3	1	1	1	7	−1	4	22	31
14 560.4	1.217	$2,u$								0	22	<25
14 560.6	1.201	$1,g$								1	22	<25
14 560.9	1.216	$2,g$								0	22	<25
14 561.7	1.182	$1,g$								3	22	<25
14 562.1	1.202	$1,g$								1	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 562.7	1.175	2,*g*								3	23	<25
14 565.1	1.190	2,*g*								2	22	<25
14 565.1	1.158	0,u^-	3	1	0	1	−1	3	1	4	22	82
14 565.4	1.166	1,*g*								4	23	<25
14 565.5	1.174	0,u^+								3	23	<25
14 565.6	1.191	0,u^+								2	22	<25
14 565.8	1.192	0,g^+	0	1	1	3	1	11	−1	2	22	26
14 566.4	1.205	1,*u*								1	22	<25
14 566.8	1.190	2,*u*								2	22	<25
14 567.3	1.169	2,*g*	1	3	0	2	−2	6	4	4	22	26
14 567.3	1.218	2,*g*								0	22	<25
14 567.4	1.190	0,g^-								2	22	<25
14 567.5	1.203	1,*g*								1	22	<25
14 567.7	1.164	1,*u*								4	23	<25
14 567.9	1.157	0,u^+	0	5	0	5	1	3	−1	5	23	34
14 568.7	1.202	0,u^+								1	23	<25
14 568.7	1.202	0,g^+								1	23	<25
14 568.8	1.203	1,*u*								1	22	<25
14 569.5	1.174	2,*u*								3	23	<25
14 570.6	1.159	2,*u*	3	1	0	1	−1	3	3	4	22	59
14 571.0	1.158	2,*u*	0	5	0	5	5	3	−3	5	23	39
14 571.5	1.166	0,u^+	1	3	0	1	1	7	−1	4	22	31
14 571.6	1.187	0,u^+								2	22	<25
14 571.8	1.186	1,*g*								2	23	<25
14 571.8	1.186	1,*u*								2	23	<25
14 572.2	1.172	1,*u*	3	0	0	2	−2	5	3	3	22	27
14 572.6	1.190	2,*u*								2	22	<25
14 572.6	1.217	0,u^+								0	22	<25
14 572.8	1.180	1,*g*								3	22	<25
14 573.3	1.189	0,g^+								2	22	<25
14 574.2	1.190	0,u^-								2	22	<25
14 574.8	1.217	2,*u*								0	22	<25
14 574.8	1.163	1,*u*								4	23	<25
14 575.2	1.217	0,g^+								0	22	<25
14 575.5	1.168	0,g^+	1	3	0	2	0	6	0	4	22	32
14 575.8	1.191	2,*u*								2	22	<25
14 576.2	1.215	1,*g*								0	21	<25
14 576.2	1.215	1,*u*								0	21	<25
14 576.2	1.168	2,*g*								4	22	<25
14 576.4	1.205	1,*g*								1	22	<25
14 576.6	1.190	2,*g*								2	22	<25
14 576.8	1.158	0,g^+	0	5	0	6	2	2	−2	5	23	38
		0,g^+	0	5	0	6	0	2	0	5	23	48
14 576.9	1.177	1,*g*								3	22	<25
14 576.9	1.167	1,*g*								4	23	<25
14 577.5	1.176	0,u^-								3	23	<25
14 577.5	1.176	0,g^-								3	23	<25
14 578.3	1.179	1,*u*								3	22	<25
14 579.0	1.159	2,*u*	3	1	0	1	1	3	1	4	22	59
14 579.3	1.202	1,*u*								1	22	<25
14 580.3	1.190	2,*g*								2	22	<25
14 580.3	1.190	0,g^-								2	22	<25
14 581.1	1.176	2,*u*								3	23	<25
14 581.5	1.176	2,*g*								3	23	<25
14 582.6	1.202	2,*u*								1	23	<25
14 582.6	1.202	2,*g*								1	23	<25
14 582.6	1.190	0,u^+								2	22	<25
14 582.9	1.158	2,*g*	0	5	0	6	2	2	0	5	23	42
		2,*g*	0	5	0	6	0	2	2	5	23	35
14 583.0	1.188	0,g^+								2	22	<25
14 583.4	1.188	2,*u*								2	22	<25
14 584.3	1.189	2,*g*								2	22	<25
14 584.8	1.190	1,*u*								2	23	<25
14 584.8	1.190	1,*g*								2	23	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 585.3	1.189	2,u								2	22	<25
14 586.3	1.166	2,u								4	22	<25
14 586.6	1.153	0,g^+	1	4	0	6	0	0	0	5	23	39
14 586.8	1.203	1,u								1	22	<25
14 586.9	1.175	0,g^+								3	23	<25
14 587.1	1.168	2,g	1	3	0	2	0	6	2	4	22	31
14 587.1	1.176	0,u^+								3	23	<25
14 588.4	1.190	2,g								2	22	<25
14 588.9	1.190	0,g^+								2	22	<25
14 589.6	1.167	1,g								4	23	<25
14 589.9	1.173	0,u^+								3	23	<25
14 590.1	1.215	0,u^+								0	22	<25
14 590.2	1.204	1,u								1	22	<25
14 590.4	1.153	2,g	1	4	0	6	2	0	0	5	23	37
14 590.5	1.176	2,u								3	23	<25
14 590.5	1.174	0,g^+								3	23	<25
14 590.6	1.189	0,u^-								2	22	<25
14 591.2	1.204	1,g								1	22	<25
14 591.2	1.180	1,u								3	22	<25
14 591.3	1.175	2,g								3	23	<25
14 591.6	1.165	1,g	0	4	0	11	1	0	0	4	23	27
14 592.0	1.190	0,g^+								2	22	<25
14 592.2	1.154	0,g^+	4	0	0	0	0	2	0	4	22	87
14 592.9	1.191	2,u								2	22	<25
14 593.4	1.215	0,g^-								0	22	<25
14 593.5	1.179	1,u								3	22	<25
14 593.6	1.180	1,g								3	22	<25
14 594.2	1.201	1,g								1	22	<25
14 594.4	1.192	0,g^-								2	22	<25
14 595.5	1.189	2,g								2	22	<25
14 595.5	1.201	1,u								1	22	<25
14 595.9	1.157	1,g	0	4	1	0	0	5	1	5	22	93
14 596.7	1.202	1,g								1	22	<25
14 597.0	1.189	2,g								2	22	<25
14 597.3	1.215	2,g								0	22	<25
14 597.5	1.151	0,u^+								5	23	<25
14 597.6	1.168	1,u								4	23	<25
14 597.9	1.176	0,g^+								3	23	<25
14 598.7	1.177	0,u^-								3	23	<25
14 598.8	1.203	0,u^+								1	23	<25
14 598.8	1.203	0,g^+								1	23	<25
14 598.8	1.193	0,u^+								2	22	<25
14 599.0	1.173	2,g								3	23	<25
14 599.1	1.172	2,u								3	23	<25
14 599.4	1.176	0,u^+								3	23	<25
14 599.5	1.217	0,u^-								0	22	<25
14 599.5	1.177	0,g^-								3	23	<25
14 599.6	1.217	0,g^-								0	22	<25
14 599.7	1.189	2,u								2	22	<25
14 600.4	1.156	2,u	0	5	0	5	5	3	−3	5	23	34
14 600.6	1.216	2,u								0	22	<25
14 600.7	1.215	2,g								0	22	<25
14 600.9	1.176	1,g								3	22	<25
14 601.1	1.217	0,g^+								0	22	<25
14 601.4	1.177	1,u								3	22	<25
14 601.5	1.217	0,u^+								0	22	<25
14 602.1	1.158	0,u^-	0	5	0	5	−3	3	3	5	23	67
14 602.7	1.153	1,u	2	3	0	0	0	3	1	5	22	48
		1,u	1	4	0	0	0	5	1	5	22	32
14 602.9	1.163	1,g	0	2	2	7	1	0	0	4	23	34
14 602.9	1.176	2,u								3	23	<25
14 603.2	1.215	1,u								0	21	<25
14 603.2	1.215	1,g								0	21	<25
14 603.3	1.202	1,u								1	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 603.6	1.192	$0,u^-$								2	22	<25
14 604.0	1.215	$2,u$								0	22	<25
14 604.3	1.192	$2,g$								2	22	<25
14 604.4	1.162	$1,u$								4	23	<25
14 604.5	1.176	$2,g$								3	23	<25
14 604.6	1.176	$1,g$								3	22	<25
14 605.0	1.171	$1,u$	3	0	0	2	0	5	1	3	22	44
14 605.4	1.218	$1,u$								0	23	<25
14 605.4	1.218	$1,g$								0	23	<25
14 605.5	1.174	$0,u^-$								3	23	<25
14 605.6	1.175	$2,u$								3	23	<25
14 605.6	1.173	$0,u^+$								3	23	<25
14 606.1	1.176	$2,g$								3	23	<25
14 606.5	1.154	$2,g$	4	0	0	0	0	2	2	4	22	88
14 606.9	1.179	$1,g$								3	22	<25
14 607.5	1.172	$0,g^+$								3	23	<25
14 607.6	1.204	$1,u$								1	22	<25
14 607.8	1.161	$1,g$								4	23	<25
14 608.0	1.158	$1,u$	1	0	3	1	1	2	0	4	23	28
14 608.3	1.167	$0,g^+$	0	2	2	0	0	6	0	4	22	44
		$0,g^+$	0	3	1	1	1	7	−1	4	22	42
14 608.4	1.174	$2,u$								3	23	<25
14 608.4	1.161	$1,g$								4	23	<25
14 608.6	1.216	$0,g^-$								0	22	<25
14 608.6	1.191	$0,g^-$								2	22	<25
14 608.9	1.216	$2,g$								0	22	<25
14 609.2	1.189	$1,g$								2	23	<25
14 609.3	1.189	$1,u$								2	23	<25
14 609.4	1.190	$0,u^+$								2	22	<25
14 609.5	1.189	$0,u^-$								2	22	<25
14 609.6	1.173	$0,g^-$	1	0	2	6	−2	2	2	3	23	28
14 609.9	1.147	$0,g^+$	2	1	2	0	0	0	0	5	23	44
		$0,g^+$	0	1	4	0	0	0	0	5	23	26
14 610.3	1.191	$2,g$								2	22	<25
14 610.7	1.203	$2,u$								1	23	<25
14 610.7	1.203	$2,g$								1	23	<25
14 610.8	1.173	$2,g$								3	23	<25
14 610.8	1.203	$1,u$								1	22	<25
14 611.2	1.175	$1,g$								3	22	<25
14 612.0	1.204	$1,g$								1	22	<25
14 612.1	1.155	$2,u$								5	23	<25
14 612.6	1.192	$2,u$								2	22	<25
14 613.4	1.173	$2,g$								3	23	<25
14 613.4	1.178	$1,u$								3	22	<25
14 614.1	1.173	$2,u$								3	23	<25
14 615.7	1.191	$2,u$								2	22	<25
14 615.8	1.191	$0,g^+$								2	22	<25
14 617.2	1.167	$0,u^+$	2	2	0	1	1	5	−1	4	22	42
		$0,u^+$	0	4	0	1	1	9	−1	4	22	35
14 618.0	1.202	$1,g$								1	22	<25
14 618.0	1.191	$2,g$								2	22	<25
14 618.0	1.203	$1,u$								1	22	<25
14 618.1	1.214	$0,g^+$								0	22	<25
14 618.5	1.148	$0,u^+$	1	1	3	0	0	0	0	5	23	51
14 619.5	1.158	$1,g$	2	0	2	1	−1	2	2	4	23	33
14 620.6	1.161	$1,u$								4	23	<25
14 621.2	1.164	$1,g$								4	23	<25
14 621.6	1.175	$0,u^-$								3	23	<25
14 621.8	1.190	$2,u$								2	22	<25
14 621.9	1.171	$0,g^+$	0	4	0	2	2	8	−2	4	22	34
		$0,g^+$	0	4	0	2	0	8	0	4	22	38
14 622.0	1.163	$1,u$								4	23	<25
14 622.1	1.167	$2,g$	0	2	2	0	0	6	2	4	22	41
		$2,g$	0	3	1	1	1	7	1	4	22	30

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 622.2	1.144	1,u	0	5	1	3	1	0	0	6	23	93
14 622.6	1.174	0,g^+								3	23	<25
14 622.7	1.148	1,g	0	6	0	3	3	2	−2	6	23	51
		1,g	0	6	0	3	1	2	0	6	23	29
14 623.9	1.192	0,u^+								2	22	<25
14 624.1	1.191	2,u								2	22	<25
14 624.1	1.162	1,u								4	23	<25
14 624.1	1.204	0,u^+								1	23	<25
14 624.1	1.204	0,g^+								1	23	<25
14 624.7	1.173	0,u^+								3	23	<25
14 625.3	1.204	1,u								1	22	<25
14 625.9	1.175	2,u								3	23	<25
14 626.2	1.187	1,g								2	23	<25
14 626.4	1.187	1,u								2	23	<25
14 626.4	1.203	1,g								1	22	<25
14 626.6	1.153	2,g	0	4	1	5	3	1	−1	5	23	53
14 626.7	1.204	1,u								1	22	<25
14 627.1	1.191	0,u^+								2	22	<25
14 627.2	1.191	2,g								2	22	<25
14 627.4	1.217	2,u								0	22	<25
14 627.7	1.165	0,u^+	1	2	1	0	0	6	0	4	22	70
14 628.1	1.175	0,g^+								3	23	<25
14 628.1	1.155	0,g^-	0	4	1	5	−1	1	1	5	23	78
14 629.0	1.175	0,u^+								3	23	<25
14 629.1	1.174	2,g								3	23	<25
14 629.5	1.175	2,g								3	23	<25
14 630.0	1.152	0,g^+	0	4	1	5	1	1	−1	5	23	38
14 630.6	1.187	1,u								2	23	<25
14 630.8	1.174	2,u								3	23	<25
14 631.0	1.187	1,g								2	23	<25
14 631.0	1.179	1,u								3	22	<25
14 631.2	1.167	2,u								4	22	<25
14 631.3	1.217	0,u^+								0	22	<25
14 631.5	1.171	2,g	0	4	0	2	0	8	2	4	22	36
14 631.6	1.164	1,u								4	23	<25
14 631.8	1.190	2,u								2	22	<25
14 632.3	1.215	2,g								0	22	<25
14 632.5	1.191	0,g^+								2	22	<25
14 632.8	1.164	0,u^-	2	2	0	1	−1	5	1	4	22	60
14 633.0	1.174	2,u								3	23	<25
14 633.5	1.203	1,g								1	22	<25
14 635.8	1.169	0,g^-	0	3	1	1	−1	7	1	4	22	86
14 636.6	1.203	1,g								1	22	<25
14 636.9	1.175	2,g								3	23	<25
14 637.0	1.154	2,g	0	4	1	5	1	1	1	5	23	67
14 637.2	1.166	1,g								4	23	<25
14 637.5	1.204	2,u								1	23	<25
14 637.5	1.204	2,g								1	23	<25
14 637.6	1.189	0,g^-								2	22	<25
14 638.2	1.174	0,g^-								3	23	<25
14 638.3	1.202	0,u^-								1	23	<25
14 638.3	1.202	0,g^-								1	23	<25
14 639.0	1.204	1,u								1	22	<25
14 639.3	1.192	2,u								2	22	<25
14 639.8	1.156	1,u	2	3	0	0	0	3	1	5	22	31
		1,u	1	4	0	0	0	5	1	5	22	28
		1,u	0	5	0	0	0	7	1	5	22	35
14 639.9	1.188	0,u^-								2	22	<25
14 640.1	1.160	1,g	0	0	4	3	1	0	0	4	23	35
14 640.4	1.165	2,u	1	2	1	0	0	6	2	4	22	58
14 640.4	1.175	0,g^+								3	23	<25
14 640.7	1.191	2,g								2	22	<25
14 640.7	1.173	0,u^-								3	23	<25
14 641.5	1.215	0,g^+								0	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 641.8	1.174	$0,g^-$								3	23	<25
14 643.0	1.215	$0,u^-$								0	22	<25
14 643.1	1.157	$0,u^+$	0	5	0	5	3	3	−3	5	23	46
14 643.4	1.187	1,*u*								2	23	<25
14 643.6	1.182	1,*g*								3	22	<25
14 643.8	1.192	$0,g^+$								2	22	<25
14 643.9	1.202	2,*g*								1	23	<25
14 643.9	1.202	2,*u*								1	23	<25
14 644.0	1.187	1,*g*								2	23	<25
14 644.5	1.153	2,*u*	1	4	0	5	3	1	−1	5	23	35
14 645.8	1.165	1,*u*								4	23	<25
14 645.9	1.216	$0,u^-$								0	22	<25
14 646.2	1.215	1,*u*								0	21	<25
14 646.2	1.215	1,*g*								0	21	<25
14 646.4	1.148	1,*g*	0	6	0	3	3	2	−2	6	23	37
		1,*g*	0	6	0	3	−1	2	2	6	23	43
14 646.6	1.181	1,*u*								3	22	<25
14 646.8	1.164	2,*u*	2	2	0	1	1	5	1	4	22	37
14 647.0	1.190	$0,u^+$								2	22	<25
14 647.3	1.205	1,*g*								1	22	<25
14 647.6	1.163	1,*g*								4	23	<25
14 647.6	1.190	$0,g^-$								2	22	<25
14 648.1	1.174	2,*g*								3	23	<25
14 648.4	1.205	$0,u^-$								1	21	<25
14 648.4	1.205	$0,g^+$								1	21	<25
14 648.6	1.153	$0,u^+$	1	4	0	5	1	1	−1	5	23	35
14 649.3	1.173	2,*u*								3	23	<25
14 649.8	1.189	$0,u^-$								2	22	<25
14 650.0	1.189	2,*g*								2	22	<25
14 650.4	1.169	2,*g*	0	3	1	1	1	7	1	4	22	35
		2,*g*	0	3	1	1	−1	7	3	4	22	43
14 650.4	1.189	2,*u*								2	22	<25
14 650.4	1.157	2,*u*	0	5	0	5	3	3	−1	5	23	33
14 652.0	1.166	1,*u*								4	23	<25
14 652.1	1.175	2,*g*								3	23	<25
14 652.7	1.186	1,*g*								2	23	<25
14 652.7	1.175	$0,g^+$								3	23	<25
14 652.8	1.186	1,*u*	1	0	1	13	1	0	0	2	23	27
14 652.8	1.216	2,*u*								0	22	<25
14 653.1	1.176	2,*u*								3	23	<25
14 653.7	1.183	1,*u*								3	22	<25
14 654.6	1.191	2,*g*								2	22	<25
14 654.6	1.179	1,*g*								3	22	<25
14 654.7	1.215	2,*g*								0	22	<25
14 654.8	1.177	2,*g*								3	23	<25
14 654.9	1.204	1,*g*								1	22	<25
14 655.2	1.176	$0,u^-$								3	23	<25
14 655.3	1.164	1,*g*								4	23	<25
14 655.4	1.173	$0,u^+$								3	23	<25
14 655.7	1.190	1,*u*								2	23	<25
14 655.9	1.215	2,*u*								0	22	<25
14 655.9	1.189	2,*u*								2	22	<25
14 656.0	1.190	1,*g*								2	23	<25
14 656.0	1.177	$0,g^-$								3	23	<25
14 656.1	1.216	2,*g*								0	22	<25
14 656.2	1.205	2,*u*								1	21	<25
14 656.2	1.205	2,*g*								1	21	<25
14 656.4	1.216	2,*u*								0	22	<25
14 656.9	1.173	2,*u*								3	23	<25
14 656.9	1.177	$0,g^+$								3	23	<25
14 657.2	1.174	1,*g*								3	22	<25
14 657.5	1.176	2,*g*								3	23	<25
14 657.8	1.202	1,*u*								1	22	<25
14 658.0	1.203	1,*g*								1	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 658.0	1.177	$0,u^+$								3	23	<25
14 658.5	1.192	$2,g$								2	22	<25
14 658.5	1.191	$0,g^+$								2	22	<25
14 660.3	1.203	$1,g$								1	22	<25
14 660.5	1.177	$1,u$								3	22	<25
14 661.2	1.176	$0,u^+$								3	23	<25
14 661.6	1.192	$0,g^-$								2	22	<25
14 661.7	1.163	$1,u$								4	23	<25
14 662.8	1.189	$2,u$								2	22	<25
14 663.0	1.177	$2,g$								3	23	<25
14 663.8	1.189	$1,g$								2	23	<25
14 663.9	1.191	$0,u^-$								2	22	<25
14 664.1	1.165	$1,u$								4	23	<25
14 664.3	1.150	$2,g$	1	2	2	2	2	0	0	5	23	44
		$2,g$	0	3	2	4	2	0	0	5	23	33
14 664.3	1.189	$1,u$								2	23	<25
14 664.4	1.151	$0,g^+$	1	2	2	2	0	0	0	5	23	29
		$0,g^+$	0	3	2	4	0	0	0	5	23	29
14 664.6	1.177	$2,u$								3	23	<25
14 664.8	1.189	$0,g^+$								2	22	<25
14 665.6	1.216	$2,g$								0	22	<25
14 665.6	1.154	$0,u^-$	1	4	0	5	−1	1	1	5	23	57
14 666.5	1.144	$1,g$	1	5	0	3	1	0	0	6	23	81
14 667.0	1.170	$0,u^+$	1	3	0	1	1	7	−1	4	22	50
		$0,u^+$	0	4	0	1	1	9	−1	4	22	36
14 667.7	1.153	$2,u$	1	3	1	4	2	0	0	5	23	33
14 668.1	1.176	$2,u$								3	23	<25
14 669.7	1.202	$1,g$								1	22	<25
14 670.0	1.218	$2,u$								0	22	<25
14 670.3	1.187	$1,u$								2	23	<25
14 670.5	1.152	$0,u^+$	1	3	1	4	0	0	0	5	23	51
14 670.7	1.218	$1,u$								0	23	<25
14 670.7	1.218	$1,g$								0	23	<25
14 671.0	1.191	$0,u^+$								2	22	<25
14 671.0	1.175	$0,u^+$								3	23	<25
14 671.1	1.187	$1,g$								2	23	<25
14 671.2	1.164	$1,u$								4	23	<25
14 671.4	1.191	$2,g$								2	22	<25
14 671.5	1.204	$1,u$								1	22	<25
14 671.7	1.191	$2,u$								2	22	<25
14 671.8	1.176	$0,u^+$								3	23	<25
14 671.9	1.162	$1,g$								4	23	<25
14 672.0	1.175	$0,g^+$								3	23	<25
14 672.1	1.166	$1,u$								4	23	<25
14 672.5	1.175	$2,g$								3	23	<25
14 673.0	1.179	$1,u$	0	1	2	0	0	9	1	3	22	46
14 673.1	1.174	$0,g^+$								3	23	<25
14 674.3	1.163	$1,g$	1	1	2	3	3	2	−2	4	23	27
14 674.5	1.176	$2,u$								3	23	<25
14 674.5	1.190	$2,g$								2	22	<25
14 675.2	1.190	$1,u$								2	23	<25
14 675.5	1.154	$2,u$	1	4	0	5	1	1	1	5	23	41
14 676.1	1.179	$1,g$								3	22	<25
14 676.2	1.190	$1,g$								2	23	<25
14 676.3	1.214	$0,u^+$	0	0	0	21	1	1	−1	0	22	33
14 676.5	1.192	$2,g$								2	22	<25
14 676.7	1.160	$0,g^+$	3	1	0	0	0	4	0	4	22	76
14 677.3	1.218	$1,u$								0	23	<25
14 677.3	1.218	$1,g$								0	23	<25
14 677.3	1.216	$0,g^+$								0	22	<25
14 677.4	1.193	$0,u^+$								2	22	<25
14 678.0	1.156	$0,g^+$								5	23	<25
14 678.1	1.204	$1,g$								1	22	<25
14 678.1	1.192	$0,u^-$								2	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 678.4	1.173	$0,g^-$								3	23	<25
14 678.7	1.204	$0,u^-$								1	23	<25
14 678.7	1.204	$0,g^-$								1	23	<25
14 679.2	1.217	$0,u^-$								0	22	<25
14 679.3	1.174	$2,g$								3	23	<25
14 679.6	1.164	$1,g$								4	23	<25
14 680.0	1.167	$1,u$								4	23	<25
14 680.0	1.189	$0,g^+$	2	0	0	2	0	10	0	2	22	26
14 680.3	1.170	$2,u$	1	3	0	1	−1	7	3	4	22	29
14 680.6	1.191	$2,u$								2	22	<25
14 680.8	1.176	$0,g^+$								3	23	<25
14 681.0	1.179	$1,g$								3	22	<25
14 681.0	1.168	$0,u^-$	1	3	0	1	−1	7	1	4	22	50
14 681.2	1.203	$2,g$								1	23	<25
14 681.2	1.203	$2,u$								1	23	<25
14 681.2	1.180	$1,u$								3	22	<25
14 681.4	1.165	$1,u$								4	23	<25
14 681.7	1.203	$1,u$								1	22	<25
14 681.9	1.201	$0,u^+$								1	23	<25
14 681.9	1.201	$0,g^+$								1	23	<25
14 682.0	1.175	$0,u^+$								3	23	<25
14 682.1	1.176	$0,g^+$								3	23	<25
14 682.2	1.165	$1,g$								4	23	<25
14 682.3	1.148	$1,g$	0	6	0	3	1	2	0	6	23	56
		$1,g$	0	6	0	3	−1	2	2	6	23	30
14 682.4	1.174	$0,u^-$								3	23	<25
14 682.7	1.176	$2,u$								3	23	<25
14 682.8	1.175	$2,g$								3	23	<25
14 684.8	1.159	$1,u$	1	4	0	0	0	5	1	5	22	37
		$1,u$	0	5	0	0	0	7	1	5	22	58
14 685.2	1.218	$0,g^+$								0	22	<25
14 685.4	1.187	$1,u$								2	23	<25
14 685.7	1.175	$2,u$								3	23	<25
14 685.8	1.154	$2,u$	0	4	1	4	4	2	−2	5	23	27
14 686.1	1.217	$2,g$								0	22	<25
14 686.3	1.176	$2,g$								3	23	<25
14 686.4	1.176	$0,u^+$								3	23	<25
14 686.6	1.193	$2,u$								2	22	<25
14 686.9	1.192	$0,u^-$								2	22	<25
14 687.2	1.153	$0,u^+$								5	23	<25
14 687.5	1.187	$1,g$								2	23	<25
14 687.6	1.205	$1,u$								1	22	<25
14 688.5	1.214	$2,u$								0	22	<25
14 688.5	1.177	$0,g^-$								3	23	<25
14 688.8	1.174	$2,u$								3	23	<25
14 689.0	1.175	$2,g$								3	23	<25
14 689.5	1.187	$1,g$								2	23	<25
14 689.6	1.174	$2,g$								3	23	<25
14 689.8	1.176	$0,u^-$								3	23	<25
14 690.4	1.164	$1,u$								4	23	<25
14 690.4	1.171	$1,g$	3	0	0	1	1	6	0	3	22	40
		$1,g$	3	0	0	1	−1	6	2	3	22	37
14 691.0	1.160	$2,g$	3	1	0	0	0	4	2	4	22	77
14 691.3	1.157	$2,g$								5	23	<25
14 691.6	1.191	$2,u$								2	22	<25
14 691.7	1.175	$2,u$								3	23	<25
14 692.1	1.189	$2,g$								2	22	<25
14 693.1	1.176	$0,g^-$								3	23	<25
14 693.3	1.168	$2,u$	1	3	0	1	1	7	1	4	22	28
14 693.5	1.187	$1,u$								2	23	<25
14 693.6	1.204	$0,u^-$								1	23	<25
14 693.6	1.204	$0,g^-$								1	23	<25
14 693.7	1.175	$0,u^-$								3	23	<25
14 693.8	1.203	$2,g$								1	23	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 693.8	1.203	2,u								1	23	<25
14 694.3	1.177	0,g^+								3	23	<25
14 695.2	1.167	1,u								4	23	<25
14 695.2	1.217	0,g^-								0	22	<25
14 695.3	1.191	0,g^-								2	22	<25
14 695.4	1.187	1,g								2	23	<25
14 695.9	1.176	2,u								3	23	<25
14 697.1	1.176	1,u	2	1	0	2	0	7	1	3	22	31
14 697.4	1.216	0,g^-								0	22	<25
14 697.8	1.176	0,u^-								3	23	<25
14 698.2	1.186	1,u								2	23	<25
14 698.2	1.204	1,u								1	22	<25
14 698.7	1.205	1,g								1	22	<25
14 698.7	1.191	0,u^+								2	22	<25
14 698.8	1.163	1,g								4	23	<25
14 698.8	1.174	0,g^+								3	23	<25
14 698.9	1.204	1,u								1	22	<25
14 699.2	1.202	0,u^+								1	23	<25
14 699.2	1.202	0,g^+								1	23	<25
14 699.2	1.159	0,u^-	0	5	0	5	−1	3	1	5	23	73
14 699.3	1.161	1,u								4	23	<25
14 699.5	1.177	2,g								3	23	<25
14 699.9	1.217	0,u^+								0	22	<25
14 700.1	1.159	0,g^-	0	5	0	4	−4	4	4	5	23	54
14 700.8	1.176	2,u								3	23	<25
14 701.3	1.193	2,u								2	22	<25
14 701.7	1.204	2,g								1	23	<25
14 701.7	1.204	2,u								1	23	<25
14 701.7	1.169	1,g								4	23	<25
14 702.3	1.191	2,g								2	22	<25
14 702.4	1.176	2,g								3	23	<25
14 703.2	1.173	0,g^-								3	23	<25
14 703.5	1.177	2,g								3	23	<25
14 703.9	1.193	0,g^+								2	22	<25
14 704.3	1.175	0,u^+								3	23	<25
14 706.4	1.159	2,u	0	5	0	5	1	3	1	5	23	47
14 706.8	1.187	1,g								2	23	<25
14 707.2	1.216	2,g								0	22	<25
14 707.6	1.175	2,u								3	23	<25
14 707.9	1.188	1,u								2	23	<25
14 708.6	1.154	0,u^-	0	3	2	3	−1	1	1	5	23	27
		0,u^-	1	4	0	5	−1	1	1	5	23	25
		0,u^-	0	4	1	4	−2	2	2	5	23	31
14 709.2	1.165	1,u								4	23	<25
14 709.2	1.175	0,u^+								3	23	<25
14 710.1	1.206	1,u								1	22	<25
14 710.1	1.187	1,u								2	23	<25
14 710.5	1.175	2,g								3	23	<25
14 710.6	1.181	1,g								3	22	<25
14 710.8	1.191	2,u								2	22	<25
14 711.1	1.191	0,u^-	0	0	2	1	−1	11	1	2	22	30
14 711.1	1.190	0,u^+								2	22	<25
14 711.3	1.175	0,g^+								3	23	<25
14 711.5	1.191	0,g^-								2	22	<25
14 711.6	1.162	1,g	2	2	0	7	1	0	0	4	23	27
14 711.8	1.187	1,g								2	23	<25
14 712.5	1.176	0,u^-								3	23	<25
14 712.8	1.176	2,u								3	23	<25
14 713.0	1.174	0,u^+								3	23	<25
14 713.6	1.155	0,g^+								5	23	<25
14 714.4	1.155	2,u								5	23	<25
14 715.2	1.181	1,u	0	2	1	1	−1	10	2	3	22	30
14 715.3	1.189	1,g								2	23	<25
14 715.6	1.193	2,g								2	22	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 715.9	1.175	2,*u*								3	23	<25
14 716.0	1.190	2,*u*								2	22	<25
14 716.0	1.175	0,u^-								3	23	<25
14 716.2	1.165	1,*g*								4	23	<25
14 716.3	1.203	1,*u*								1	22	<25
14 716.8	1.204	1,*g*								1	22	<25
14 717.2	1.164	1,*u*								4	23	<25
14 717.2	1.174	2,*g*								3	23	<25
14 717.5	1.202	2,*g*								1	23	<25
14 717.5	1.202	2,*u*								1	23	<25
14 718.0	1.173	0,g^+	1	0	2	4	4	4	−4	3	23	30
14 718.2	1.216	2,*u*								0	22	<25
14 718.6	1.175	2,*u*								3	23	<25
14 718.6	1.217	2,*g*								0	22	<25
14 718.9	1.175	0,u^+								3	23	<25
14 719.1	1.177	0,g^-								3	23	<25
14 719.7	1.158	1,*u*								4	23	<25
14 719.7	1.188	1,*u*								2	23	<25
14 720.0	1.167	1,*g*								4	23	<25
14 720.1	1.191	2,*g*								2	22	<25
14 720.3	1.176	2,*g*								3	23	<25
14 720.9	1.205	1,*u*								1	22	<25
14 721.0	1.188	1,*g*								2	23	<25
14 721.0	1.155	2,*g*	1	3	1	3	3	1	−1	5	23	26
14 721.3	1.190	0,g^+								2	22	<25
14 721.9	1.175	2,*u*								3	23	<25
14 722.1	1.204	1,*g*								1	22	<25
14 723.4	1.202	1,*u*								1	22	<25
14 724.0	1.203	1,*g*								1	22	<25
14 724.6	1.189	1,*u*								2	23	<25
14 724.8	1.176	0,u^+								3	23	<25
14 724.9	1.137	0,u^+	0	7	0	1	1	1	−1	7	23	99
14 725.0	1.189	1,*g*								2	23	<25
14 725.8	1.190	1,*u*								2	23	<25
14 725.8	1.174	0,u^-								3	23	<25
14 725.9	1.175	2,*u*								3	23	<25
14 726.0	1.183	1,*u*	0	3	0	2	−2	11	3	3	22	27
14 726.3	1.191	2,*u*								2	22	<25
14 726.7	1.175	2,*g*								3	23	<25
14 726.9	1.175	0,g^-								3	23	<25
14 727.3	1.164	1,*g*								4	23	<25
14 727.8	1.176	2,*u*								3	23	<25
14 728.3	1.187	1,*g*								2	23	<25
14 728.7	1.174	0,g^-								3	23	<25
14 729.0	1.157	2,*g*	0	5	0	4	4	4	−2	5	23	35
14 729.1	1.188	1,*u*								2	23	<25
14 729.2	1.193	0,g^+								2	22	<25
14 729.4	1.189	1,*g*								2	23	<25
14 729.9	1.217	2,*u*								0	22	<25
14 729.9	1.217	2,*g*								0	22	<25
14 730.1	1.175	2,*g*								3	23	<25
14 730.3	1.159	0,g^+	0	5	0	4	4	4	−4	5	23	44
14 730.5	1.188	1,*u*								2	23	<25
14 731.0	1.203	1,*u*								1	22	<25
14 732.0	1.172	0,u^-	0	4	0	1	−1	9	1	4	22	68
14 732.6	1.178	1,*g*								3	22	<25
14 732.8	1.191	0,u^+								2	22	<25
14 733.0	1.164	1,*g*								4	23	<25
14 733.1	1.187	1,*u*								2	23	<25
14 733.3	1.175	0,g^+								3	23	<25
14 733.6	1.202	0,u^-								1	23	<25
14 733.6	1.202	0,g^-								1	23	<25
14 733.7	1.190	2,*g*								2	22	<25
14 733.7	1.166	0,g^+	2	2	0	0	0	6	0	4	22	40

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,g^+$	1	3	0	0	0	8	0	4	22	33
14 733.8	1.193	$0,u^-$								2	22	<25
14 734.0	1.175	$2,u$								3	23	<25
14 734.0	1.192	$0,g^+$								2	22	<25
14 734.4	1.188	$1,g$								2	23	<25
14 734.6	1.176	$0,g^+$								3	23	<25
14 734.7	1.175	$2,g$								3	23	<25
14 734.8	1.177	$0,u^-$								3	23	<25
14 735.5	1.187	$1,u$								2	23	<25
14 735.5	1.154	$0,g^-$	1	3	1	3	−1	1	1	5	23	33
14 735.7	1.204	$0,u^+$								1	23	<25
14 735.7	1.204	$0,g^+$								1	23	<25
14 735.8	1.191	$0,g^-$	1	0	1	1	−1	11	1	2	22	28
14 736.0	1.165	$1,u$								4	23	<25
14 736.3	1.176	$2,g$								3	23	<25
14 736.5	1.181	$1,g$	1	1	1	0	0	9	1	3	22	31
14 736.5	1.187	$1,g$								2	23	<25
14 736.7	1.202	$2,u$								1	23	<25
14 736.9	1.202	$2,g$								1	23	<25
14 737.5	1.191	$2,g$								2	22	<25
14 737.6	1.170	$0,u^+$	0	3	1	0	0	8	0	4	22	88
14 738.1	1.192	$0,g^+$								2	22	<25
14 738.2	1.190	$0,u^-$								2	22	<25
14 738.4	1.177	$0,u^+$								3	23	<25
14 738.5	1.137	$0,u^-$	0	7	0	1	−1	1	1	7	23	100
14 739.1	1.175	$0,g^-$								3	23	<25
14 739.6	1.176	$2,u$								3	23	<25
14 739.8	1.204	$1,g$								1	22	<25
14 740.1	1.217	$2,u$								0	22	<25
14 740.5	1.217	$1,u$								0	23	<25
14 740.5	1.217	$1,g$								0	23	<25
14 741.1	1.184	$1,g$								3	22	<25
14 741.9	1.172	$2,u$	0	4	0	1	1	9	1	4	22	39
14 742.0	1.163	$1,u$	2	0	2	0	0	3	1	4	23	27
14 742.0	1.214	$0,g^+$	0	0	0	22	0	0	0	0	22	26
14 742.4	1.217	$0,u^-$								0	22	<25
14 742.6	1.188	$1,g$								2	23	<25
14 743.0	1.187	$1,u$								2	23	<25
14 743.1	1.177	$0,u^+$								3	23	<25
14 743.3	1.175	$2,g$								3	23	<25
14 743.8	1.190	$1,u$								2	23	<25
14 743.9	1.188	$1,g$								2	23	<25
14 744.1	1.217	$0,u^+$								0	22	<25
14 744.7	1.159	$1,g$	1	0	3	0	0	3	1	4	23	57
14 744.8	1.203	$2,u$								1	23	<25
14 744.8	1.203	$2,g$								1	23	<25
14 744.8	1.193	$2,g$								2	22	<25
14 744.8	1.176	$0,g^+$								3	23	<25
14 744.9	1.165	$1,u$								4	23	<25
14 745.0	1.192	$2,u$								2	22	<25
14 745.5	1.177	$0,u^-$								3	23	<25
14 745.8	1.174	$0,u^+$								3	23	<25
14 746.0	1.178	$2,u$								3	23	<25
14 746.1	1.154	$2,u$	0	3	2	3	3	1	−1	5	23	46
		$2,u$	0	4	1	4	4	2	−2	5	23	33
14 746.2	1.192	$2,g$								2	22	<25
14 746.3	1.137	$2,u$	0	7	0	1	1	1	1	7	23	100
14 746.7	1.153	$0,u^+$	0	3	2	3	1	1	−1	5	23	29
		$0,u^+$	0	4	1	4	2	2	−2	5	23	30
14 747.0	1.190	$2,u$								2	22	<25
14 747.2	1.156	$2,g$								5	23	<25
14 747.7	1.203	$1,g$								1	22	<25
14 747.9	1.163	$1,u$								4	23	<25
14 747.9	1.166	$2,g$	2	2	0	0	0	6	2	4	22	42

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		2,*g*	1	3	0	0	0	8	2	4	22	32
14 748.3	1.174	0,g^+								3	23	<25
14 748.7	1.191	2,*u*								2	22	<25
14 748.8	1.165	1,*g*								4	23	<25
14 749.1	1.189	1,*g*								2	23	<25
14 749.2	1.174	0,g^+								3	23	<25
14 749.6	1.176	0,u^-								3	23	<25
14 750.1	1.176	2,*g*								3	23	<25
14 750.2	1.194	0,g^+								2	22	<25
14 750.5	1.204	0,u^+								1	23	<25
14 750.5	1.204	0,g^+								1	23	<25
14 750.6	1.215	2,*g*								0	22	<25
14 750.7	1.161	1,*u*								4	23	<25
14 750.8	1.217	0,g^+								0	22	<25
14 751.6	1.163	1,*g*								4	23	<25
14 751.6	1.176	2,*u*								3	23	<25
14 752.0	1.176	2,*u*								3	23	<25
14 752.8	1.205	1,*g*								1	22	<25
14 752.9	1.144	1,*g*	0	5	1	2	2	1	−1	6	23	58
14 753.2	1.170	2,*u*	0	3	1	0	0	8	2	4	22	73
14 753.2	1.156	0,u^+	0	4	1	4	2	2	−2	5	23	27
		0,u^+	0	4	1	4	0	2	0	5	23	55
14 753.3	1.176	0,g^-								3	23	<25
14 753.5	1.188	1,*g*								2	23	<25
14 753.5	1.175	0,u^+								3	23	<25
14 753.6	1.164	1,*u*								4	23	<25
14 753.9	1.176	0,g^+								3	23	<25
14 754.0	1.188	1,*u*								2	23	<25
14 754.0	1.192	2,*g*								2	22	<25
14 754.1	1.176	2,*g*								3	23	<25
14 754.9	1.154	0,u^-	0	3	2	3	−1	1	1	5	23	32
		0,u^-	0	4	1	4	−2	2	2	5	23	41
14 755.2	1.175	2,*u*								3	23	<25
14 755.5	1.174	2,*g*								3	23	<25
14 755.5	1.216	0,u^-	0	0	0	21	−1	1	1	0	22	26
14 755.5	1.175	0,g^-								3	23	<25
14 756.2	1.187	1,*u*								2	23	<25
14 756.4	1.165	1,*g*								4	23	<25
14 756.8	1.191	0,g^-	2	0	0	2	−2	10	2	2	22	29
14 756.9	1.174	2,*u*								3	23	<25
14 757.1	1.205	1,*g*								1	22	<25
14 757.4	1.155	2,*u*	0	4	1	4	2	2	0	5	23	57
14 758.4	1.174	2,*g*								3	23	<25
14 758.4	1.218	1,*u*								0	23	<25
14 758.4	1.218	1,*g*								0	23	<25
14 759.3	1.216	2,*u*								0	22	<25
14 759.5	1.152	0,g^+	0	2	3	1	1	1	−1	5	23	27
14 759.9	1.165	1,*g*								4	23	<25
14 760.1	1.175	2,*g*								3	23	<25
14 760.3	1.216	2,*g*								0	22	<25
14 760.6	1.187	1,*g*								2	23	<25
14 761.0	1.174	0,u^+								3	23	<25
14 761.1	1.165	1,*u*								4	23	<25
14 761.5	1.217	0,g^-								0	22	<25
14 761.6	1.177	0,u^-								3	23	<25
14 761.6	1.175	0,g^+								3	23	<25
14 761.7	1.217	0,u^+								0	22	<25
14 761.8	1.193	2,*g*								2	22	<25
14 761.8	1.176	2,*u*								3	23	<25
14 761.9	1.178	1,*u*								3	22	<25
14 762.7	1.204	0,u^+								1	23	<25
14 762.7	1.204	0,g^+								1	23	<25
14 763.0	1.217	0,u^-								0	22	<25
14 763.1	1.203	2,*u*								1	23	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 763.1	1.159	1,u	3	0	1	3	1	0	0	4	23	27
14 763.2	1.217	0,g^+								0	22	<25
14 763.5	1.203	2,g								1	23	<25
14 763.6	1.205	1,u								1	22	<25
14 764.9	1.205	1,g								1	22	<25
14 764.9	1.176	2,g								3	23	<25
14 765.2	1.192	0,u^+								2	22	<25
14 765.3	1.188	1,u								2	23	<25
14 766.4	1.174	1,u	3	0	0	0	0	7	1	3	22	61
14 766.7	1.202	2,u								1	23	<25
14 766.7	1.155	2,u	0	4	1	4	0	2	2	5	23	57
14 767.0	1.175	2,u								3	23	<25
14 767.4	1.177	2,g								3	23	<25
14 767.4	1.156	0,g^-	0	5	0	4	−2	4	2	5	23	33
14 767.5	1.188	1,u								2	23	<25
14 767.5	1.153	2,g	1	3	1	3	3	1	−1	5	23	38
		2,g	1	4	0	4	4	2	−2	5	23	36
14 768.0	1.202	0,u^+								1	23	<25
14 768.0	1.202	0,g^+								1	23	<25
14 768.1	1.177	0,g^-								3	23	<25
14 768.2	1.189	1,g								2	23	<25
14 768.2	1.176	0,g^+								3	23	<25
14 768.3	1.152	0,g^+	2	3	0	4	0	0	0	5	23	45
14 768.5	1.177	0,u^-								3	23	<25
14 768.6	1.202	2,g								1	23	<25
14 768.6	1.166	1,g								4	23	<25
14 768.9	1.216	2,u								0	22	<25
14 769.0	1.188	1,g								2	23	<25
14 769.1	1.175	0,u^+								3	23	<25
14 769.5	1.176	2,u								3	23	<25
14 769.9	1.191	2,g								2	22	<25
14 770.4	1.188	1,u								2	23	<25
14 770.5	1.176	2,g								3	23	<25
14 771.0	1.191	0,g^-								2	22	<25
14 771.1	1.202	0,u^+								1	23	<25
14 771.1	1.202	0,g^+								1	23	<25
14 772.0	1.164	1,g								4	23	<25
14 772.1	1.204	1,u								1	22	<25
14 772.2	1.174	2,u								3	23	<25
14 772.3	1.175	0,u^+								3	23	<25
14 772.7	1.202	2,u								1	23	<25
14 772.7	1.202	2,g								1	23	<25
14 772.9	1.206	1,u								1	22	<25
14 774.0	1.192	2,u								2	22	<25
14 774.0	1.154	2,g								5	23	<25
14 774.1	1.150	0,u^+	1	2	2	1	1	1	−1	5	23	49
14 774.2	1.188	1,g								2	23	<25
14 774.5	1.163	1,u								4	23	<25
14 774.6	1.205	1,g								1	22	<25
14 774.7	1.176	0,g^+								3	23	<25
14 775.6	1.154	2,g	2	3	0	4	2	0	0	5	23	42
14 775.6	1.177	1,g	2	1	0	1	1	8	0	3	22	32
		1,g	2	1	0	1	−1	8	2	3	22	30
14 776.0	1.192	0,u^+	1	0	1	0	0	12	0	2	22	30
14 776.4	1.164	1,u								4	23	<25
14 776.4	1.188	1,g								2	23	<25
14 776.9	1.188	1,u								2	23	<25
14 776.9	1.176	0,g^-								3	23	<25
14 777.0	1.176	2,g								3	23	<25
14 777.0	1.147	1,u	0	6	0	2	2	3	−1	6	23	26
		1,u	0	6	0	2	0	3	1	6	23	25
14 777.2	1.175	0,u^+								3	23	<25
14 777.9	1.156	0,g^-	1	4	0	4	−2	2	2	5	23	30
		0,g^-	0	5	0	4	−2	4	2	5	23	33

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 778.0	1.145	1,*g*	0	5	1	2	2	1	−1	6	23	27
		1,*g*	0	5	1	2	0	1	1	6	23	67
14 778.3	1.203	2,*u*								1	23	<25
14 778.3	1.203	0,u^-								1	23	<25
14 778.3	1.203	0,g^-								1	23	<25
14 779.1	1.189	1,*u*								2	23	<25
14 779.3	1.176	2,*u*								3	23	<25
14 779.7	1.161	1,*u*								4	23	<25
14 779.9	1.166	1,*g*								4	23	<25
14 779.9	1.176	2,*g*								3	23	<25
14 780.7	1.203	2,*g*								1	23	<25
14 780.8	1.188	1,*g*								2	23	<25
14 780.9	1.203	2,*u*								1	23	<25
14 781.2	1.176	2,*u*								3	23	<25
14 781.5	1.203	1,*u*								1	22	<25
14 781.5	1.202	2,*g*								1	23	<25
14 781.6	1.169	1,*g*								4	23	<25
14 781.8	1.176	2,*g*								3	23	<25
14 782.7	1.177	0,u^-								3	23	<25
14 782.7	1.169	0,g^+	2	2	0	0	0	6	0	4	22	32
		0,g^+	0	4	0	0	0	10	0	4	22	34
14 782.9	1.177	0,u^-								3	23	<25
14 783.1	1.176	0,g^+								3	23	<25
14 783.4	1.189	1,*g*								2	23	<25
14 784.1	1.151	0,g^+	1	3	1	3	1	1	−1	5	23	37
14 784.7	1.163	1,*g*								4	23	<25
14 784.7	1.175	0,g^+								3	23	<25
14 784.8	1.178	0,u^+								3	23	<25
14 785.0	1.155	2,*g*								5	23	<25
14 785.1	1.162	1,*u*								4	23	<25
14 785.3	1.191	2,*g*								2	22	<25
14 786.5	1.203	1,*g*								1	22	<25
14 786.6	1.215	1,*u*								0	21	<25
14 786.6	1.215	1,*g*								0	21	<25
14 786.8	1.165	1,*g*								4	23	<25
14 787.0	1.176	0,u^+								3	23	<25
14 787.2	1.188	1,*u*								2	23	<25
14 787.4	1.176	0,g^-								3	23	<25
14 787.5	1.192	2,*u*								2	22	<25
14 787.8	1.193	0,u^+	2	0	0	1	1	11	−1	2	22	27
14 788.6	1.188	1,*u*								2	23	<25
14 788.6	1.190	0,u^-								2	22	<25
14 788.8	1.182	1,*u*	0	2	1	1	1	10	0	3	22	33
		1,*u*	0	2	1	1	−1	10	2	3	22	35
14 789.2	1.176	2,*g*								3	23	<25
14 789.5	1.189	1,*g*								2	23	<25
14 789.6	1.177	2,*u*								3	23	<25
14 789.6	1.175	2,*g*								3	23	<25
14 789.7	1.203	2,*u*								1	23	<25
14 789.9	1.202	0,u^-								1	23	<25
14 789.9	1.202	0,g^-								1	23	<25
14 790.3	1.176	2,*g*								3	23	<25
14 790.7	1.183	1,*g*								3	22	<25
14 790.8	1.203	2,*g*								1	23	<25
14 791.2	1.175	0,g^-								3	23	<25
14 791.5	1.187	1,*u*								2	23	<25
14 791.6	1.177	0,g^+								3	23	<25
14 792.0	1.189	1,*u*								2	23	<25
14 793.0	1.164	1,*g*								4	23	<25
14 793.2	1.155	0,g^+	1	4	0	4	2	2	−2	5	23	27
		0,g^+	1	4	0	4	0	2	0	5	23	41
14 793.5	1.175	2,*u*								3	23	<25
14 794.4	1.217	0,g^-	0	0	0	2	−2	20	2	0	22	26
14 794.4	1.152	0,g^-	1	3	1	3	−1	1	1	5	23	48

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 794.9	1.150	2,u	1	2	2	1	1	1	1	5	23	45
14 795.2	1.165	1,u								4	23	<25
14 795.3	1.202	2,u								1	23	<25
14 795.3	1.192	0,u^-								2	22	<25
14 795.7	1.177	2,u								3	23	<25
14 795.9	1.217	1,u								0	23	<25
14 795.9	1.217	1,g								0	23	<25
14 796.0	1.169	2,g	2	2	0	0	0	6	2	4	22	32
		2,g	1	3	0	0	0	8	2	4	22	26
		2,g	0	4	0	0	0	10	2	4	22	34
14 796.1	1.177	2,g								3	23	<25
14 796.2	1.150	0,u^-	1	2	2	1	−1	1	1	5	23	67
14 796.4	1.204	1,u								1	22	<25
14 796.5	1.178	0,u^+								3	23	<25
14 796.7	1.204	1,g								1	22	<25
14 796.8	1.177	2,u								3	23	<25
14 796.9	1.188	1,g								2	23	<25
14 797.0	1.188	1,u								2	23	<25
14 797.1	1.165	1,g								4	23	<25
14 798.1	1.146	1,u	1	5	0	2	2	1	−1	6	23	33
		1,u	0	6	0	2	−2	3	3	6	23	44
14 798.4	1.188	1,g								2	23	<25
14 798.4	1.175	0,u^-								3	23	<25
14 799.1	1.154	2,g								5	23	<25
14 799.1	1.176	2,g								3	23	<25
14 799.4	1.192	2,u								2	22	<25
14 799.8	1.189	1,g								2	23	<25
14 800.3	1.217	2,g								0	22	<25
14 800.3	1.202	0,g^+								1	23	<25
14 800.5	1.202	0,u^+								1	23	<25
14 800.5	1.176	0,g^+								3	23	<25
14 800.6	1.162	1,u								4	23	<25
14 800.8	1.192	0,u^+								2	22	<25
14 800.8	1.174	0,u^-								3	23	<25
14 801.0	1.192	2,u								2	22	<25
14 801.9	1.194	0,g^+	0	1	1	1	1	13	−1	2	22	26
14 802.3	1.155	0,g^+								5	23	<25
14 802.4	1.176	2,u								3	23	<25
14 802.9	1.188	1,g								2	23	<25
14 803.2	1.202	0,u^-								1	23	<25
14 803.7	1.202	0,g^-								1	23	<25
14 803.7	1.191	0,g^+								2	22	<25
14 803.9	1.189	1,u								2	23	<25
14 803.9	1.178	0,g^-								3	23	<25
14 804.0	1.204	1,u								1	22	<25
14 804.3	1.191	2,u								2	22	<25
14 804.6	1.189	1,u								2	23	<25
14 805.5	1.157	0,u^+								5	23	<25
14 805.6	1.177	2,u								3	23	<25
14 805.6	1.154	2,g	1	4	0	4	0	2	2	5	23	34
14 806.1	1.216	2,u								0	22	<25
14 806.1	1.166	1,g								4	23	<25
14 806.4	1.216	2,g								0	22	<25
14 806.7	1.188	1,g								2	23	<25
14 806.9	1.189	1,u								2	23	<25
14 807.1	1.164	1,u								4	23	<25
14 807.1	1.175	0,u^+								3	23	<25
14 807.3	1.176	2,g								3	23	<25
14 807.3	1.193	0,u^-								2	22	<25
14 807.4	1.202	2,g								1	23	<25
14 808.3	1.175	2,u								3	23	<25
14 808.4	1.188	1,g								2	23	<25
14 808.5	1.169	1,u								4	23	<25
14 808.6	1.218	0,u^+	0	0	0	1	1	21	−1	0	22	36

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 808.8	1.175	$0,u^-$								3	23	<25
14 808.9	1.177	$0,g^+$								3	23	<25
14 809.2	1.147	1,*u*	0	6	0	2	2	3	−1	6	23	46
14 810.6	1.189	1,*u*								2	23	<25
14 810.9	1.177	2,*g*								3	23	<25
14 811.1	1.218	1,*u*								0	23	<25
14 811.1	1.218	1,*g*								0	23	<25
14 811.4	1.178	$0,u^+$								3	23	<25
14 811.8	1.193	2,*g*								2	22	<25
14 812.0	1.205	1,*u*								1	22	<25
14 812.1	1.189	1,*g*								2	23	<25
14 812.2	1.175	2,*g*								3	23	<25
14 812.3	1.189	1,*u*								2	23	<25
14 812.9	1.166	1,*u*								4	23	<25
14 813.0	1.142	1,*g*	0	4	2	1	1	0	0	6	23	72
14 813.4	1.175	2,*u*								3	23	<25
14 813.4	1.176	$0,g^+$								3	23	<25
14 813.6	1.202	2,*g*								1	23	<25
14 813.7	1.202	2,*u*								1	23	<25
14 814.0	1.175	$0,g^-$								3	23	<25
14 814.3	1.155	$0,g^-$	0	4	1	3	−3	3	3	5	23	37
14 814.5	1.166	1,*u*								4	23	<25
14 814.7	1.192	2,*g*								2	22	<25
14 814.8	1.201	2,*u*								1	23	<25
14 814.8	1.158	1,*g*								4	23	<25
14 814.8	1.202	$0,u^-$								1	23	<25
14 814.8	1.202	$0,g^-$								1	23	<25
14 814.9	1.201	2,*g*								1	23	<25
14 815.0	1.188	1,*u*								2	23	<25
14 815.5	1.217	2,*u*								0	22	<25
14 815.6	1.216	$0,g^+$	0	0	0	22	0	0	0	0	22	34
14 815.7	1.189	1,*g*								2	23	<25
14 815.8	1.177	$0,g^+$								3	23	<25
14 816.1	1.192	2,*u*								2	22	<25
14 817.2	1.202	$0,u^+$								1	23	<25
14 817.2	1.202	$0,g^+$								1	23	<25
14 817.3	1.164	1,*g*								4	23	<25
14 817.5	1.175	2,*u*								3	23	<25
14 818.1	1.176	2,*u*								3	23	<25
14 818.6	1.175	2,*g*								3	23	<25
14 818.7	1.217	2,*g*								0	22	<25
14 818.8	1.194	2,*u*								2	22	<25
14 819.1	1.176	$0,u^+$								3	23	<25
14 819.2	1.217	$0,g^-$								0	22	<25
14 819.4	1.217	$0,u^+$								0	22	<25
14 819.5	1.188	1,*g*								2	23	<25
14 819.8	1.184	1,*u*								3	22	<25
14 820.1	1.165	1,*g*								4	23	<25
14 820.1	1.177	$0,u^-$								3	23	<25
14 820.3	1.155	2,*g*								5	23	<25
14 820.5	1.218	2,*u*								0	22	<25
14 820.9	1.215	1,*u*								0	21	<25
14 821.0	1.215	1,*g*								0	21	<25
14 821.2	1.145	1,*u*	1	5	0	2	2	1	−1	6	23	26
		1,*u*	1	5	0	2	0	1	1	6	23	46
14 821.4	1.189	1,*u*								2	23	<25
14 821.5	1.205	1,*g*								1	22	<25
14 821.7	1.177	$0,g^+$								3	23	<25
14 821.8	1.202	2,*u*								1	23	<25
14 821.9	1.174	$0,u^+$								3	23	<25
14 822.0	1.189	1,*g*								2	23	<25
14 822.5	1.187	1,*u*								2	23	<25
14 822.6	1.202	2,*g*								1	23	<25
14 822.9	1.156	2,*u*								5	23	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 823.0	1.202	$0,u^+$								1	23	<25
14 823.7	1.188	$1,g$								2	23	<25
14 823.7	1.176	$0,u^+$								3	23	<25
14 824.0	1.192	$0,g^-$	0	1	1	1	−1	13	1	2	22	27
14 824.2	1.176	$2,g$								3	23	<25
14 825.0	1.202	$2,u$								1	23	<25
14 825.0	1.202	$0,g^+$								1	23	<25
14 825.4	1.187	$1,g$								2	23	<25
14 826.5	1.176	$2,g$								3	23	<25
14 826.5	1.175	$0,g^+$								3	23	<25
14 826.7	1.216	$2,g$	0	0	0	22	2	0	0	0	22	28
14 827.4	1.190	$1,u$								2	23	<25
14 827.6	1.175	$0,u^+$								3	23	<25
14 827.6	1.160	$0,g^+$	0	5	0	4	2	4	−2	5	23	34
		$0,g^+$	0	5	0	4	0	4	0	5	23	46
14 827.7	1.165	$1,u$								4	23	<25
14 828.3	1.176	$2,u$								3	23	<25
14 828.4	1.175	$0,g^-$								3	23	<25
14 828.6	1.176	$2,g$								3	23	<25
14 829.0	1.189	$1,u$								2	23	<25
14 829.0	1.150	$0,u^+$	2	2	1	2	0	0	0	5	23	41
14 829.1	1.189	$1,g$								2	23	<25
14 829.3	1.163	$1,g$								4	23	<25
14 829.5	1.178	$0,u^-$	1	2	0	7	−5	5	5	3	23	32
14 830.3	1.174	$2,u$								3	23	<25
14 830.3	1.205	$0,u^-$								1	23	<25
14 830.3	1.204	$0,g^-$								1	23	<25
14 830.8	1.161	$1,g$	3	1	0	5	1	0	0	4	23	26
14 831.1	1.176	$0,g^+$								3	23	<25
14 831.7	1.189	$1,u$								2	23	<25
14 832.4	1.177	$2,g$								3	23	<25
14 833.0	1.192	$2,g$								2	22	<25
14 833.1	1.203	$2,u$								1	23	<25
14 833.1	1.203	$2,g$								1	23	<25
14 833.1	1.150	$2,u$	2	2	1	2	2	0	0	5	23	42
14 833.4	1.177	$2,g$								3	23	<25
14 833.4	1.189	$1,u$								2	23	<25
14 833.6	1.166	$1,u$								4	23	<25
14 833.9	1.218	$1,u$								0	23	<25
14 833.9	1.218	$1,g$								0	23	<25
14 834.0	1.175	$0,g^-$								3	23	<25
14 834.7	1.176	$2,u$								3	23	<25
14 834.8	1.173	$0,g^+$								3	23	<25
14 835.2	1.156	$0,u^-$	1	4	0	3	−3	3	3	5	23	32
14 835.7	1.164	$1,u$								4	23	<25
14 835.8	1.160	$2,g$	0	5	0	4	2	4	0	5	23	33
		$2,g$	0	5	0	4	0	4	2	5	23	41
14 836.0	1.178	$0,g^-$								3	23	<25
14 836.1	1.176	$2,u$								3	23	<25
14 836.1	1.193	$0,g^-$								2	22	<25
14 836.2	1.188	$1,g$								2	23	<25
14 836.3	1.179	$1,u$	2	1	0	0	0	9	1	3	22	46
14 836.5	1.205	$1,u$								1	22	<25
14 836.5	1.175	$2,g$								3	23	<25
14 836.7	1.188	$1,g$								2	23	<25
14 837.1	1.206	$1,g$								1	22	<25
14 837.2	1.172	$0,g^+$	1	3	0	0	0	8	0	4	22	37
		$0,g^+$	0	4	0	0	0	10	0	4	22	55
14 837.4	1.156	$0,g^+$								5	23	<25
14 837.7	1.203	$2,u$								1	23	<25
14 837.7	1.176	$2,u$								3	23	<25
14 837.8	1.174	$0,u^+$								3	23	<25
14 838.0	1.164	$1,g$								4	23	<25
14 838.0	1.203	$0,g^-$	0	0	1	9	−9	9	9	1	23	27

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 838.1	1.181	1,*g*	1	2	0	1	−1	10	2	3	22	28
14 838.1	1.203	0,u^+								1	23	<25
14 838.3	1.203	0,g^+								1	23	<25
14 838.4	1.188	1,*g*								2	23	<25
14 838.5	1.202	2,*g*	1	0	0	10	10	8	−8	1	23	28
14 838.6	1.187	1,*u*								2	23	<25
14 838.8	1.142	1,*u*	1	4	1	1	1	0	0	6	23	72
14 840.3	1.176	0,g^+								3	23	<25
14 841.1	1.202	2,*g*								1	23	<25
14 841.7	1.175	2,*g*								3	23	<25
14 841.7	1.176	0,g^-								3	23	<25
14 842.2	1.175	2,*u*								3	23	<25
14 842.5	1.163	1,*u*								4	23	<25
14 842.8	1.201	0,u^-								1	23	<25
14 843.3	1.205	1,*u*								1	22	<25
14 843.3	1.188	1,*g*								2	23	<25
14 843.4	1.188	1,*u*								2	23	<25
14 843.5	1.183	1,*g*	0	2	1	0	0	11	1	3	22	70
14 843.8	1.148	1,*u*	0	6	0	2	0	3	1	6	23	52
14 844.1	1.202	2,*g*								1	23	<25
14 844.1	1.158	1,*g*	3	0	1	2	2	1	−1	4	23	29
14 844.1	1.217	1,*u*								0	23	<25
14 844.2	1.217	1,*g*								0	23	<25
14 844.7	1.155	0,u^+								5	23	<25
14 845.0	1.178	0,u^+								3	23	<25
14 845.4	1.202	0,u^-								1	23	<25
14 845.4	1.202	0,g^-								1	23	<25
14 845.7	1.173	2,*u*								3	23	<25
14 845.9	1.205	1,*u*								1	22	<25
14 845.9	1.175	0,u^+								3	23	<25
14 846.1	1.189	1,*u*								2	23	<25
14 846.2	1.156	2,*g*								5	23	<25
14 846.2	1.202	0,u^+								1	23	<25
14 846.2	1.202	0,g^+								1	23	<25
14 846.4	1.202	0,g^+								1	23	<25
14 847.3	1.202	2,*u*								1	23	<25
14 847.7	1.188	1,*g*								2	23	<25
14 847.7	1.175	0,u^-								3	23	<25
14 847.8	1.193	2,*g*								2	22	<25
14 847.8	1.205	1,*g*								1	22	<25
14 847.9	1.191	0,g^+								2	22	<25
14 848.3	1.176	2,*g*								3	23	<25
14 848.3	1.204	0,u^-								1	23	<25
14 848.4	1.204	0,g^-								1	23	<25
14 849.0	1.206	1,*g*								1	22	<25
14 849.4	1.217	0,u^-								0	22	<25
14 849.5	1.166	1,*g*								4	23	<25
14 849.7	1.202	2,*u*								1	23	<25
14 849.8	1.175	2,*g*								3	23	<25
14 849.8	1.175	0,g^-								3	23	<25
14 849.9	1.203	2,*g*								1	23	<25
14 850.0	1.172	2,*g*	1	3	0	0	0	8	2	4	22	37
		2,*g*	0	4	0	0	0	10	2	4	22	55
14 850.0	1.217	0,g^+								0	22	<25
14 851.2	1.188	1,*u*								2	23	<25
14 851.2	1.193	0,u^+	1	1	0	1	1	13	−1	2	22	35
14 851.5	1.176	0,u^-								3	23	<25
14 852.0	1.169	1,*g*								4	23	<25
14 852.0	1.202	2,*g*								1	23	<25
14 852.4	1.177	2,*g*								3	23	<25
14 852.5	1.177	2,*u*								3	23	<25
14 852.6	1.174	0,u^+								3	23	<25
14 852.7	1.189	1,*g*								2	23	<25
14 852.7	1.202	2,*u*								1	23	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 852.8	1.165	1,u								4	23	<25
14 853.0	1.189	1,u								2	23	<25
14 853.4	1.176	0,u^-								3	23	<25
14 853.5	1.176	0,u^-								3	23	<25
14 854.4	1.177	0,g^+								3	23	<25
14 854.6	1.165	1,g								4	23	<25
14 855.3	1.189	1,g								2	23	<25
14 855.8	1.156	2,u								5	23	<25
14 856.0	1.177	0,u^+								3	23	<25
14 856.3	1.217	0,u^-								0	22	<25
14 856.8	1.176	2,u								3	23	<25
14 857.0	1.189	1,u								2	23	<25
14 857.0	1.202	0,u^+								1	23	<25
14 857.1	1.202	0,g^+								1	23	<25
14 857.1	1.177	0,g^+								3	23	<25
14 857.6	1.178	2,g								3	23	<25
14 858.0	1.177	2,u								3	23	<25
14 858.2	1.202	2,u								1	23	<25
14 858.3	1.166	1,u								4	23	<25
14 858.5	1.177	0,g^-								3	23	<25
14 858.6	1.189	1,u								2	23	<25
14 859.6	1.178	2,u								3	23	<25
14 859.9	1.188	1,g								2	23	<25
14 859.9	1.178	0,u^+	1	2	0	7	5	5	−5	3	23	28
14 860.5	1.204	1,g								1	22	<25
14 860.9	1.191	2,g								2	22	<25
14 861.0	1.193	0,g^+	1	1	0	0	0	14	0	2	22	26
14 861.4	1.189	1,g								2	23	<25
14 861.6	1.175	2,g								3	23	<25
14 861.8	1.202	2,g								1	23	<25
14 862.1	1.166	1,g								4	23	<25
14 862.1	1.146	0,g^+	2	1	2	0	0	0	0	5	23	29
		0,g^+	0	1	4	0	0	0	0	5	23	58
14 862.4	1.203	2,u								1	23	<25
14 862.5	1.176	0,g^+								3	23	<25
14 862.6	1.217	2,u								0	22	<25
14 862.6	1.217	2,g								0	22	<25
14 862.7	1.193	2,u								2	22	<25
14 862.7	1.203	1,u								1	22	<25
14 862.8	1.163	1,u								4	23	<25
14 863.3	1.188	1,u								2	23	<25
14 863.5	1.202	0,u^+								1	23	<25
14 863.7	1.177	2,u								3	23	<25
14 863.7	1.202	0,g^+								1	23	<25
14 864.2	1.157	2,u	0	5	0	3	3	5	−1	5	23	27
14 864.2	1.175	0,u^-								3	23	<25
14 865.1	1.202	2,g								1	23	<25
14 865.1	1.176	2,g								3	23	<25
14 865.2	1.217	2,u								0	22	<25
14 865.2	1.165	1,g								4	23	<25
14 865.4	1.176	2,u								3	23	<25
14 865.4	1.158	0,u^-	0	5	0	3	−3	5	3	5	23	49
14 865.8	1.190	1,u								2	23	<25
14 866.3	1.204	1,g								1	22	<25
14 866.3	1.195	0,u^+	0	1	1	0	0	14	0	2	22	40
14 866.5	1.155	0,u^+	1	4	0	3	3	3	−3	5	23	35
14 866.9	1.189	1,u								2	23	<25
14 867.0	1.188	1,g								2	23	<25
14 867.5	1.191	0,u^-								2	22	<25
14 868.1	1.176	0,u^-								3	23	<25
14 868.7	1.202	2,u								1	23	<25
14 868.7	1.175	2,g								3	23	<25
14 868.8	1.178	2,u								3	23	<25
14 868.9	1.188	1,g								2	23	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 869.1	1.159	1,*g*	0	0	4	1	1	2	0	4	23	29
14 869.1	1.188	1,*u*								2	23	<25
14 869.4	1.179	0,g^+								3	23	<25
14 869.5	1.175	2,*u*								3	23	<25
14 869.9	1.190	1,*g*								2	23	<25
14 870.2	1.202	2,*g*								1	23	<25
14 871.0	1.201	0,g^-								1	23	<25
14 871.0	1.154	0,g^+	0	3	2	2	2	2	−2	5	23	31
14 871.3	1.189	1,*g*								2	23	<25
14 871.5	1.202	2,*g*								1	23	<25
14 872.1	1.178	0,g^-								3	23	<25
14 872.4	1.193	2,*g*								2	22	<25
14 872.5	1.177	2,*g*								3	23	<25
14 872.8	1.177	2,*u*								3	23	<25
14 872.8	1.189	1,*u*								2	23	<25
14 872.8	1.205	1,*u*								1	22	<25
14 872.8	1.202	0,u^-								1	23	<25
14 872.9	1.175	0,u^+								3	23	<25
14 873.2	1.205	1,*g*								1	22	<25
14 873.7	1.166	1,*u*								4	23	<25
14 874.0	1.202	0,u^-								1	23	<25
14 874.1	1.164	1,*g*								4	23	<25
14 874.1	1.175	0,g^+								3	23	<25
14 874.3	1.188	1,*g*								2	23	<25
14 874.3	1.202	0,g^-								1	23	<25
14 874.6	1.201	0,u^+								1	23	<25
14 875.0	1.193	2,*u*								2	22	<25
14 875.5	1.160	1,*g*								4	23	<25
14 875.6	1.177	2,*g*								3	23	<25
14 875.9	1.203	2,*u*								1	23	<25
14 876.5	1.189	1,*u*								2	23	<25
14 876.7	1.134	0,u^+	0	6	1	0	0	0	0	7	23	99
14 877.0	1.202	2,*g*								1	23	<25
14 877.0	1.176	0,u^+								3	23	<25
14 877.6	1.154	0,g^-	0	3	2	2	−2	2	2	5	23	48
		0,g^-	0	4	1	3	−3	3	3	5	23	33
14 877.9	1.189	1,*g*								2	23	<25
14 878.3	1.164	1,*g*								4	23	<25
14 878.4	1.203	0,u^+								1	23	<25
14 878.4	1.203	0,g^+								1	23	<25
14 878.5	1.155	2,*u*	2	3	0	3	3	1	−1	5	23	27
		2,*u*	0	5	0	3	−3	5	5	5	23	26
14 878.6	1.176	0,g^+								3	23	<25
14 878.7	1.189	1,*g*								2	23	<25
14 878.7	1.175	2,*g*								3	23	<25
14 879.4	1.188	1,*u*								2	23	<25
14 879.4	1.175	0,u^-								3	23	<25
14 879.6	1.219	0,g^+	0	0	0	0	0	22	0	0	22	45
14 880.1	1.202	2,*u*								1	23	<25
14 880.1	1.174	2,*g*								3	23	<25
14 880.7	1.175	0,g^+								3	23	<25
14 880.8	1.174	2,*u*								3	23	<25
14 881.0	1.192	2,*u*								2	22	<25
14 881.2	1.165	1,*u*								4	23	<25
14 881.4	1.202	2,*u*								1	23	<25
14 881.9	1.176	0,u^-								3	23	<25
14 882.0	1.175	2,*g*								3	23	<25
14 882.1	1.168	1,*u*								4	23	<25
14 882.3	1.179	0,g^-								3	23	<25
14 882.4	1.154	2,*g*	0	3	2	2	2	2	0	5	23	45
		2,*g*	0	4	1	3	3	3	−1	5	23	27
14 883.3	1.217	1,*u*								0	23	<25
14 883.3	1.157	0,g^-	0	4	1	3	−1	3	1	5	23	78
14 883.9	1.189	1,*u*								2	23	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 884.1	1.217	1,g								0	23	<25
14 884.6	1.174	2,u								3	23	<25
14 884.9	1.202	0,g^-								1	23	<25
14 885.6	1.202	2,g								1	23	<25
14 885.6	1.177	0,u^-								3	23	<25
14 886.1	1.188	1,u								2	23	<25
14 886.3	1.202	0,g^+	1	0	0	10	8	8	−8	1	23	27
14 886.6	1.190	1,g								2	23	<25
14 886.6	1.152	0,u^+	2	3	0	3	1	1	−1	5	23	58
14 887.4	1.203	0,u^-								1	23	<25
14 887.5	1.176	0,g^-								3	23	<25
14 887.6	1.170	1,u								4	23	<25
14 887.7	1.219	2,g	0	0	0	0	0	22	2	0	22	41
14 887.7	1.154	0,g^+	0	3	2	2	0	2	0	5	23	30
14 888.6	1.202	0,u^+								1	23	<25
14 889.0	1.165	1,g								4	23	<25
14 889.2	1.176	2,u								3	23	<25
14 889.2	1.195	0,g^-								2	22	<25
14 889.3	1.189	1,u								2	23	<25
14 889.3	1.177	2,g								3	23	<25
14 889.5	1.177	0,u^+								3	23	<25
14 890.1	1.174	0,g^+								3	23	<25
14 890.5	1.176	2,g								3	23	<25
14 890.6	1.153	2,u	2	3	0	3	3	1	−1	5	23	35
14 890.6	1.202	0,g^-								1	23	<25
14 890.7	1.156	2,g	0	4	1	3	1	3	1	5	23	57
14 890.7	1.177	0,g^-								3	23	<25
14 890.8	1.189	1,g								2	23	<25
14 890.8	1.202	2,u								1	23	<25
14 891.2	1.154	0,u^+	1	4	0	3	1	3	−1	5	23	30
14 891.3	1.203	2,g								1	23	<25
14 891.4	1.202	0,g^+								1	23	<25
14 891.6	1.182	1,u	1	2	0	0	0	11	1	3	22	34
14 891.9	1.202	2,g								1	23	<25
14 891.9	1.189	1,u								2	23	<25
14 892.0	1.178	2,g								3	23	<25
14 892.0	1.202	2,u								1	23	<25
14 892.5	1.178	2,u								3	23	<25
14 892.6	1.189	1,g								2	23	<25
14 893.3	1.176	0,u^+								3	23	<25
14 894.0	1.162	1,u								4	23	<25
14 894.2	1.204	0,u^+								1	23	<25
14 894.9	1.196	0,u^+								2	22	<25
14 895.0	1.203	0,g^+								1	23	<25
14 895.1	1.153	0,u^-	2	3	0	3	−1	1	1	5	23	49
		0,u^-	1	4	0	3	−3	3	3	5	23	28
14 895.6	1.189	1,u								2	23	<25
14 895.7	1.178	2,g								3	23	<25
14 895.9	1.204	1,u								1	22	<25
14 896.0	1.189	1,g								2	23	<25
14 896.6	1.189	1,u								2	23	<25
14 896.8	1.191	0,g^+	2	0	0	0	0	12	0	2	22	32
14 897.6	1.185	1,g	0	3	0	1	1	12	0	3	22	31
		1,g	0	3	0	1	−1	12	2	3	22	31
14 897.6	1.202	2,g								1	23	<25
14 897.9	1.176	0,g^-								3	23	<25
14 898.0	1.217	1,g								0	23	<25
14 898.0	1.217	1,u								0	23	<25
14 898.0	1.178	0,u^-								3	23	<25
14 898.3	1.167	1,u								4	23	<25
14 898.7	1.195	2,g								2	22	<25
14 898.7	1.177	2,u								3	23	<25
14 898.9	1.177	2,g								3	23	<25
14 899.5	1.157	0,u^+	0	5	0	3	3	5	−3	5	23	32

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 899.6	1.219	1,*u*								0	23	<25
14 899.6	1.219	1,*g*								0	23	<25
14 899.6	1.217	0,g^-	0	0	0	2	−2	20	2	0	22	26
14 899.7	1.174	0,g^-								3	23	<25
14 900.1	1.163	1,*u*								4	23	<25
14 900.5	1.188	1,*g*								2	23	<25
14 900.7	1.175	0,g^+								3	23	<25
14 900.9	1.189	1,*u*								2	23	<25
14 900.9	1.217	0,u^+								0	22	<25
14 901.0	1.162	1,*g*								4	23	<25
14 901.3	1.178	0,u^-								3	23	<25
14 901.5	1.177	0,u^+								3	23	<25
14 901.6	1.177	2,*g*								3	23	<25
14 901.7	1.155	2,*g*	0	3	2	2	0	2	2	5	23	27
		2,*g*	0	4	1	3	−1	3	3	5	23	44
14 902.0	1.175	2,*u*								3	23	<25
14 903.0	1.202	2,*u*								1	23	<25
14 903.0	1.204	1,*g*								1	22	<25
14 903.3	1.153	0,u^-	1	3	1	2	−2	2	2	5	23	40
14 903.4	1.189	1,*u*								2	23	<25
14 904.1	1.204	0,g^+								1	23	<25
14 904.3	1.204	0,u^+								1	23	<25
14 904.4	1.179	0,u^+								3	23	<25
14 904.5	1.177	0,g^+								3	23	<25
14 904.6	1.203	2,*g*								1	23	<25
14 904.7	1.154	2,*u*								5	23	<25
14 905.3	1.196	2,*u*								2	22	<25
14 905.7	1.155	2,*u*	2	3	0	3	1	1	1	5	23	28
14 906.0	1.190	1,*g*								2	23	<25
14 906.0	1.164	1,*g*								4	23	<25
14 906.0	1.203	0,u^+								1	23	<25
14 906.2	1.178	2,*u*								3	23	<25
14 906.6	1.204	1,*g*								1	22	<25
14 907.3	1.189	1,*g*								2	23	<25
14 907.4	1.189	1,*u*								2	23	<25
14 907.5	1.190	0,u^-								2	22	<25
14 907.6	1.202	0,u^-	1	0	0	9	−9	9	9	1	23	51
14 907.9	1.202	2,*u*								1	23	<25
14 908.6	1.155	2,*u*								5	23	<25
14 908.7	1.168	1,*g*								4	23	<25
14 909.1	1.191	1,*u*								2	23	<25
14 909.3	1.163	1,*u*	3	1	0	4	2	1	−1	4	23	25
14 909.3	1.189	1,*g*								2	23	<25
14 909.4	1.177	2,*u*								3	23	<25
14 909.6	1.192	2,*g*	2	0	0	0	0	12	2	2	22	30
14 909.6	1.176	0,u^+								3	23	<25
14 909.9	1.204	2,*u*								1	23	<25
14 910.1	1.190	1,*u*								2	23	<25
14 910.5	1.217	2,*u*								0	22	<25
14 910.5	1.217	2,*g*								0	22	<25
14 911.0	1.175	2,*g*								3	23	<25
14 911.2	1.188	1,*g*								2	23	<25
14 911.2	1.176	2,*u*								3	23	<25
14 911.7	1.217	1,*u*	0	0	0	12	12	11	−11	0	23	44
14 912.0	1.203	0,g^+								1	23	<25
14 912.1	1.204	2,*g*								1	23	<25
14 912.4	1.206	1,*u*	0	1	0	0	0	19	1	1	22	32
14 912.8	1.217	2,*g*								0	22	<25
14 912.8	1.217	2,*u*								0	22	<25
14 912.9	1.174	0,g^-								3	23	<25
14 913.0	1.166	1,*g*								4	23	<25
14 913.6	1.178	0,g^+	1	2	0	6	6	6	−6	3	23	30
14 913.8	1.175	0,u^-								3	23	<25
14 914.0	1.167	1,*u*								4	23	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 914.1	1.189	1,g								2	23	<25
14 914.2	1.188	1,u								2	23	<25
14 914.4	1.175	0,g^-								3	23	<25
14 915.4	1.173	1,u								3	24	<25
14 915.4	1.173	1,g								3	24	<25
14 915.4	1.176	2,u								3	23	<25
14 915.5	1.175	2,g								3	23	<25
14 915.6	1.204	2,u								1	23	<25
14 915.6	1.202	0,u^+	1	0	0	9	9	9	−9	1	23	28
14 915.8	1.155	0,u^+								5	23	<25
14 916.6	1.190	1,g								2	23	<25
14 916.8	1.180	0,u^-								3	23	<25
14 917.1	1.203	0,u^-								1	23	<25
14 917.8	1.202	2,g								1	23	<25
14 917.9	1.145	1,u	0	5	1	1	1	2	0	6	23	35
		1,u	0	5	1	1	−1	2	2	6	23	44
14 918.0	1.217	1,g								0	23	<25
14 918.1	1.203	0,g^-								1	23	<25
14 918.6	1.190	2,u								2	22	<25
14 919.1	1.205	1,u								1	22	<25
14 919.2	1.178	2,u								3	23	<25
14 919.4	1.202	2,u								1	23	<25
14 919.4	1.174	0,g^+	2	0	1	3	1	5	−1	3	23	26
14 919.6	1.188	1,g								2	23	<25
14 919.8	1.164	1,u								4	23	<25
14 919.9	1.202	2,g								1	23	<25
14 919.9	1.176	0,g^-								3	23	<25
14 920.0	1.176	2,g								3	23	<25
14 920.2	1.134	0,g^+	1	6	0	0	0	0	0	7	23	72
		0,g^+	0	7	0	0	0	2	0	7	23	28
14 920.4	1.190	1,g								2	23	<25
14 920.6	1.169	1,g								4	23	<25
14 920.8	1.176	2,u								3	23	<25
14 921.1	1.202	2,u								1	23	<25
14 921.2	1.151	0,g^+	1	2	2	0	0	2	0	5	23	34
14 921.3	1.167	1,g								4	23	<25
14 921.7	1.190	1,u								2	23	<25
14 922.7	1.206	1,u	1	0	0	0	0	17	1	1	22	25
14 923.0	1.178	2,u								3	23	<25
14 923.0	1.158	0,g^+	2	0	2	4	0	0	0	4	24	36
14 923.1	1.177	2,g								3	23	<25
14 923.3	1.158	0,u^+	1	0	3	4	0	0	0	4	24	39
14 923.6	1.206	1,g								1	22	<25
14 923.8	1.202	0,u^-								1	23	<25
14 924.2	1.153	0,u^+	1	3	1	2	0	2	0	5	23	35
14 924.3	1.202	2,g								1	23	<25
14 924.4	1.202	0,g^-								1	23	<25
14 924.7	1.156	0,u^-	1	4	0	3	−1	3	1	5	23	64
14 924.8	1.202	0,u^+								1	23	<25
14 925.1	1.176	2,g								3	23	<25
14 925.1	1.201	0,g^+								1	23	<25
14 925.2	1.156	2,u	1	4	0	3	−1	3	3	5	23	26
14 925.8	1.189	1,g								2	23	<25
14 926.1	1.189	1,u								2	23	<25
14 926.2	1.202	2,u								1	23	<25
14 926.5	1.202	0,u^+								1	23	<25
14 926.7	1.177	0,u^+								3	23	<25
14 926.9	1.174	2,u								3	23	<25
14 926.9	1.175	0,u^-								3	23	<25
14 927.2	1.189	1,u								2	23	<25
14 927.7	1.164	1,u								4	23	<25
14 928.3	1.190	1,g								2	23	<25
14 928.5	1.178	0,g^-								3	23	<25
14 929.4	1.163	1,u								4	23	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 929.4	1.177	2,*g*								3	23	<25
14 929.8	1.188	1,*g*								2	23	<25
14 929.8	1.189	1,*u*								2	23	<25
14 930.2	1.203	2,*u*								1	23	<25
14 930.3	1.204	$0,g^+$								1	23	<25
14 930.9	1.158	2,*g*	2	0	2	4	2	0	0	4	24	39
14 931.2	1.158	2,*u*	1	0	3	4	2	0	0	4	24	42
14 931.3	1.160	1,*u*	3	1	0	4	0	1	1	4	23	36
14 932.0	1.202	2,*g*								1	23	<25
14 932.6	1.177	2,*u*								3	23	<25
14 933.3	1.189	1,*g*								2	23	<25
14 933.6	1.203	2,*g*								1	23	<25
14 933.6	1.177	$0,g^+$								3	23	<25
14 933.8	1.217	$0,u^-$								0	22	<25
14 933.8	1.217	$0,g^+$								0	22	<25
14 934.2	1.155	2,*u*	1	4	0	3	1	3	1	5	23	34
14 934.4	1.203	$0,g^-$								1	23	<25
14 934.5	1.190	1,*u*								2	23	<25
14 935.2	1.177	$0,u^+$								3	23	<25
14 935.3	1.217	1,*u*								0	23	<25
14 935.6	1.158	1,*u*								4	23	<25
14 935.7	1.154	1,*g*	4	0	0	3	1	0	0	4	23	74
14 935.8	1.204	2,*u*								1	23	<25
14 935.9	1.189	1,*u*								2	23	<25
14 935.9	1.203	$0,u^-$								1	23	<25
14 936.0	1.176	$0,u^-$								3	23	<25
14 936.1	1.151	2,*g*	1	2	2	0	0	2	2	5	23	42
14 936.2	1.174	2,*g*								3	23	<25
14 936.3	1.178	$0,g^+$								3	23	<25
14 937.0	1.166	1,*g*								4	23	<25
14 937.3	1.203	$0,g^-$								1	23	<25
14 937.6	1.202	$0,u^-$								1	23	<25
14 938.1	1.195	$0,u^-$	0	2	0	1	−1	15	1	2	22	33
14 938.2	1.190	1,*g*								2	23	<25
14 938.6	1.177	2,*g*								3	23	<25
14 939.0	1.203	2,*g*								1	23	<25
14 939.0	1.176	$0,g^+$								3	23	<25
14 939.4	1.190	1,*u*								2	23	<25
14 939.7	1.188	1,*g*								2	23	<25
14 939.8	1.153	2,*u*								5	23	<25
14 939.9	1.217	$0,u^+$								0	22	<25
14 939.9	1.217	$0,g^-$								0	22	<25
14 939.9	1.194	$0,g^-$								2	22	<25
14 940.0	1.204	$0,u^+$								1	23	<25
14 940.1	1.166	1,*u*								4	23	<25
14 940.1	1.178	$0,g^+$								3	23	<25
14 940.2	1.146	1,*u*	0	5	1	1	1	2	0	6	23	56
		1,*u*	0	5	1	1	−1	2	2	6	23	40
14 940.2	1.173	$0,u^+$								3	23	<25
14 940.5	1.202	2,*u*								1	23	<25
14 940.7	1.136	$0,g^+$	1	6	0	0	0	0	0	7	23	28
		$0,g^+$	0	7	0	0	0	2	0	7	23	72
14 941.8	1.163	1,*g*								4	23	<25
14 941.9	1.189	1,*g*								2	23	<25
14 942.1	1.176	2,*u*								3	23	<25
14 942.3	1.202	2,*g*								1	23	<25
14 942.6	1.190	1,*u*								2	23	<25
14 942.8	1.178	$0,g^-$								3	23	<25
14 943.3	1.203	$0,g^+$								1	23	<25
14 943.3	1.194	$0,u^+$								2	22	<25
14 943.4	1.190	1,*u*								2	23	<25
14 943.5	1.193	$0,g^+$	1	1	0	0	0	14	0	2	22	33
14 944.3	1.177	2,*g*								3	23	<25
14 944.3	1.164	1,*g*	1	1	2	1	1	4	0	4	23	28

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 944.4	1.145	1,g	1	5	0	1	1	2	0	6	23	27
14 944.5	1.177	2,u								3	23	<25
14 944.8	1.150	0,g^+	1	2	2	0	0	2	0	5	23	42
14 945.1	1.156	0,u^+	0	4	1	2	2	4	−2	5	23	27
14 945.2	1.179	0,u^-								3	23	<25
14 945.4	1.178	2,g								3	23	<25
14 946.0	1.202	2,u								1	23	<25
14 946.2	1.204	1,g								1	22	<25
14 946.4	1.204	1,u								1	22	<25
14 946.6	1.177	2,g								3	23	<25
14 946.9	1.189	1,u								2	23	<25
14 947.1	1.194	2,g								2	22	<25
14 947.1	1.176	0,u^+								3	23	<25
14 947.3	1.203	2,u								1	23	<25
14 947.4	1.189	1,g								2	23	<25
14 947.7	1.164	1,u								4	23	<25
14 948.0	1.189	1,g								2	23	<25
14 948.4	1.195	2,u								2	22	<25
14 948.5	1.217	1,g								0	23	<25
14 948.6	1.179	0,g^-								3	23	<25
14 948.8	1.138	2,g	0	7	0	0	0	2	2	7	23	100
14 949.3	1.203	2,g								1	23	<25
14 949.3	1.203	0,g^-								1	23	<25
14 949.3	1.201	0,g^+								1	23	<25
14 949.6	1.177	2,u								3	23	<25
14 949.6	1.203	0,u^-								1	23	<25
14 949.6	1.177	0,g^+								3	23	<25
14 949.7	1.179	0,u^-								3	23	<25
14 949.9	1.185	1,u	1	2	0	0	0	11	1	3	22	30
		1,u	0	3	0	0	0	13	1	3	22	55
14 950.3	1.218	1,u								0	23	<25
14 950.4	1.218	1,g								0	23	<25
14 950.6	1.201	2,g								1	23	<25
14 953.1	1.177	0,u^+								3	23	<25
14 953.2	1.178	2,g								3	23	<25
14 953.4	1.190	1,g								2	23	<25
14 953.4	1.202	0,u^+								1	23	<25
14 953.5	1.174	0,g^+								3	23	<25
14 954.1	1.155	0,g^+								5	23	<25
14 954.5	1.202	0,u^-								1	23	<25
14 954.6	1.191	1,g								2	23	<25
14 954.8	1.195	2,u								2	22	<25
14 954.8	1.202	2,u								1	23	<25
14 954.8	1.177	2,u								3	23	<25
14 954.9	1.195	0,g^+	0	2	0	0	0	16	0	2	22	39
14 955.4	1.174	0,u^-								3	23	<25
14 955.9	1.178	2,g								3	23	<25
14 955.9	1.168	1,u								4	23	<25
14 955.9	1.190	1,u								2	23	<25
14 955.9	1.194	2,g	1	1	0	0	0	14	2	2	22	30
14 956.9	1.190	1,u								2	23	<25
14 956.9	1.177	2,g								3	23	<25
14 957.0	1.217	1,g								0	23	<25
14 957.0	1.176	0,g^+								3	23	<25
14 957.1	1.217	1,u								0	23	<25
14 957.2	1.148	2,g	3	2	0	2	2	0	0	5	23	42
		2,g	1	2	2	0	0	2	2	5	23	25
14 957.5	1.173	0,g^-								3	23	<25
14 958.0	1.166	1,g								4	23	<25
14 958.1	1.202	2,u								1	23	<25
14 958.1	1.173	0,u^-								3	23	<25
14 958.2	1.178	2,g								3	23	<25
14 958.3	1.150	0,g^-	2	2	1	1	−1	1	1	5	23	45
		0,g^-	0	2	3	1	−1	1	1	5	23	29

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 958.9	1.169	1,*u*								4	23	<25
14 959.0	1.176	2,*u*								3	23	<25
14 959.0	1.177	$0,u^+$								3	23	<25
14 959.4	1.217	$0,u^-$	0	0	0	1	−1	21	1	0	22	32
14 959.6	1.203	2,*g*								1	23	<25
14 959.7	1.202	$0,u^+$								1	23	<25
14 959.7	1.202	$0,g^-$								1	23	<25
14 960.0	1.203	$0,g^+$								1	23	<25
14 960.1	1.167	1,*g*								4	23	<25
14 960.2	1.190	1,*g*								2	23	<25
14 960.5	1.160	$0,u^-$	0	5	0	3	−1	5	1	5	23	70
14 960.6	1.156	2,*u*								5	23	<25
14 961.1	1.166	1,*g*								4	23	<25
14 961.4	1.178	2,*u*								3	23	<25
14 961.4	1.189	1,*u*								2	23	<25
14 961.8	1.190	1,*g*								2	23	<25
14 962.4	1.217	$0,g^+$								0	22	<25
14 962.7	1.174	2,*g*								3	23	<25
14 962.9	1.202	2,*g*								1	23	<25
14 963.0	1.176	2,*u*								3	23	<25
14 963.1	1.142	1,*g*	2	4	0	1	1	0	0	6	23	59
14 963.3	1.178	$0,g^+$								3	23	<25
14 963.8	1.217	1,*u*								0	23	<25
14 964.3	1.163	1,*u*								4	23	<25
14 964.7	1.176	2,*u*								3	23	<25
14 965.7	1.189	1,*u*								2	23	<25
14 965.8	1.202	2,*g*								1	23	<25
14 966.6	1.177	$0,u^+$								3	23	<25
14 967.1	1.175	2,*u*								3	23	<25
14 967.2	1.189	1,*g*								2	23	<25
14 967.2	1.204	2,*u*								1	23	<25
14 967.4	1.203	$0,u^+$								1	23	<25
14 967.5	1.202	$0,g^+$								1	23	<25
14 967.8	1.202	2,*u*								1	23	<25
14 967.8	1.203	$0,u^-$								1	23	<25
14 967.9	1.217	2,*u*								0	22	<25
14 968.0	1.156	2,*g*								5	23	<25
14 968.1	1.217	2,*g*								0	22	<25
14 968.2	1.163	1,*g*								4	23	<25
14 968.2	1.190	1,*u*								2	23	<25
14 968.2	1.202	$0,g^-$								1	23	<25
14 968.5	1.195	2,*g*	0	2	0	0	0	16	2	2	22	36
14 968.7	1.217	2,*u*								0	22	<25
14 968.7	1.188	$0,u^+$								2	24	<25
14 968.7	1.188	$0,g^+$								2	24	<25
14 969.0	1.176	$0,u^-$	2	1	0	5	−5	5	5	3	23	40
14 969.1	1.177	2,*g*								3	23	<25
14 969.2	1.145	$0,u^+$	3	1	1	0	0	0	0	5	23	73
14 969.6	1.167	1,*u*								4	23	<25
14 969.8	1.157	$0,u^-$	0	4	1	2	−2	4	2	5	23	48
14 969.9	1.160	2,*u*	0	5	0	3	1	5	1	5	23	43
		2,*u*	0	5	0	3	−1	5	3	5	23	26
14 970.2	1.177	$0,u^+$								3	23	<25
14 970.4	1.148	$0,g^+$	0	6	0	6	0	0	0	6	24	94
14 971.0	1.202	2,*g*								1	23	<25
14 971.3	1.191	1,*g*								2	23	<25
14 971.4	1.158	1,*u*	3	0	1	1	−1	2	2	4	23	36
14 971.5	1.218	2,*g*								0	22	<25
14 972.0	1.189	1,*u*								2	23	<25
14 972.0	1.176	2,*u*								3	23	<25
14 972.2	1.202	$0,g^+$								1	23	<25
14 972.4	1.203	$0,u^+$								1	23	<25
14 972.6	1.202	2,*g*								1	23	<25
14 972.8	1.202	2,*u*								1	23	<25

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 973.6	1.189	1,g								2	23	<25
14 973.9	1.148	0,g^+	3	2	0	2	0	0	0	5	23	54
14 974.1	1.148	2,g	0	6	0	6	2	0	0	6	24	95
14 974.1	1.202	0,g^+								1	23	<25
14 974.4	1.174	2,g								3	23	<25
14 974.9	1.189	1,g								2	23	<25
14 974.9	1.178	0,u^+								3	23	<25
14 976.3	1.178	2,g								3	23	<25
14 976.3	1.218	1,g								0	23	<25
14 976.4	1.218	1,u								0	23	<25
14 976.5	1.204	1,u								1	22	<25
14 976.6	1.217	1,g	0	0	0	11	−11	12	12	0	23	28
14 976.7	1.204	1,g								1	22	<25
14 977.2	1.190	1,u								2	23	<25
14 977.4	1.180	0,g^+								3	23	<25
14 977.5	1.203	0,u^+								1	23	<25
14 977.5	1.178	0,g^-								3	23	<25
14 977.6	1.146	1,g	1	5	0	1	−1	2	2	6	23	49
		1,g	0	6	0	1	1	4	0	6	23	32
14 977.9	1.178	0,u^+								3	23	<25
14 978.5	1.205	0,g^-								1	23	<25
14 978.6	1.205	0,u^-								1	23	<25
14 978.7	1.190	1,u								2	23	<25
14 979.0	1.176	0,u^+								3	23	<25
14 979.1	1.165	1,u								4	23	<25
14 979.1	1.157	1,g	0	5	0	9	1	0	0	5	24	73
14 979.1	1.206	1,g								1	22	<25
14 979.2	1.203	2,u								1	23	<25
14 979.5	1.176	2,u								3	23	<25
14 979.8	1.188	2,u								2	24	<25
14 979.8	1.188	2,g								2	24	<25
14 979.8	1.179	0,g^-								3	23	<25
14 979.9	1.143	1,u	0	4	2	0	0	1	1	6	23	74
14 980.3	1.189	1,g								2	23	<25
14 980.9	1.202	2,u								1	23	<25
14 981.7	1.203	0,g^+								1	23	<25
14 981.8	1.157	2,u	0	4	1	2	2	4	0	5	23	26
		2,u	0	4	1	2	−2	4	4	5	23	25
14 982.0	1.204	2,g								1	23	<25
14 982.9	1.217	0,u^-								0	22	<25
14 982.9	1.217	0,g^+								0	22	<25
14 984.1	1.178	2,u								3	23	<25
14 984.2	1.202	2,u								1	23	<25
14 984.2	1.165	1,u								4	23	<25
14 984.5	1.150	2,g	3	2	0	2	2	0	0	5	23	30
		2,g	2	2	1	1	1	1	1	5	23	29
14 984.8	1.146	1,g	1	5	0	1	1	2	0	6	23	39
		1,g	0	6	0	1	−1	4	2	6	23	37
14 984.9	1.178	2,u								3	23	<25
14 985.0	1.189	1,u								2	23	<25
14 985.8	1.201	0,u^-								1	23	<25
14 986.2	1.201	0,g^+								1	23	<25
14 986.3	1.179	2,g								3	23	<25
14 986.3	1.176	0,u^+	0	0	3	2	0	6	0	3	23	34
14 986.3	1.177	0,g^+								3	23	<25
14 986.5	1.161	1,u	0	0	4	0	0	3	1	4	23	28
14 986.6	1.176	0,g^-								3	23	<25
14 986.9	1.191	1,u								2	23	<25
14 987.1	1.190	1,g								2	23	<25
14 987.5	1.179	2,u								3	23	<25
14 987.7	1.178	2,g								3	23	<25
14 988.4	1.166	1,g								4	23	<25
14 988.4	1.202	0,g^-								1	23	<25
14 988.8	1.178	0,u^-	1	2	0	5	−5	7	5	3	23	31

TABLE 12. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 15 000 cm^{-1}, calculated from the results and model provided in El Idrissi *et al.*[30]—Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
14 989.0	1.203	2,*g*								1	23	<25
14 989.0	1.199	0,u^+								1	23	<25
14 989.0	1.202	0,g^+								1	23	<25
14 989.4	1.203	2,*g*								1	23	<25
14 989.5	1.188	1,*u*								2	23	<25
14 989.7	1.191	1,*g*								2	23	<25
14 989.7	1.176	0,g^+								3	23	<25
14 989.9	1.217	2,*u*								0	22	<25
14 989.9	1.217	2,*g*								0	22	<25
14 990.5	1.189	1,*u*								2	23	<25
14 990.9	1.203	2,*u*								1	23	<25
14 991.5	1.190	1,*g*								2	23	<25
14 991.9	1.202	2,*u*								1	23	<25
14 991.9	1.155	0,g^-	1	4	0	2	−2	4	2	5	23	38
14 992.1	1.217	1,*u*								0	23	<25
14 992.7	1.207	1,*u*	0	1	0	0	0	19	1	1	22	35
14 992.7	1.161	1,*g*	3	1	0	3	3	2	−2	4	23	37
14 992.7	1.156	0,g^+								5	23	<25
14 993.0	1.177	2,*u*								3	23	<25
14 993.3	1.174	0,u^+								3	23	<25
14 993.4	1.189	1,*g*								2	23	<25
14 993.7	1.177	2,*g*								3	23	<25
14 993.8	1.191	1,*u*								2	23	<25
14 994.3	1.203	2,*g*								1	23	<25
14 994.9	1.175	2,*u*								3	23	<25
14 995.5	1.201	0,u^-								1	23	<25
14 995.9	1.179	2,*g*								3	23	<25
14 996.0	1.171	1,*g*								4	23	<25
14 997.3	1.218	1,*g*								0	23	<25
14 997.4	1.203	0,u^+								1	23	<25
14 997.6	1.217	1,*g*	0	0	0	11	−11	12	12	0	23	33
14 997.7	1.176	0,u^+								3	23	<25
14 998.2	1.203	2,*g*								1	23	<25
14 998.4	1.202	2,*u*								1	23	<25
14 998.5	1.194	0,u^-	1	1	0	1	−1	13	1	2	22	25
14 998.6	1.167	1,*u*								4	23	<25
14 998.8	1.201	0,g^-								1	23	<25
14 999.0	1.178	0,u^-								3	23	<25
14 999.1	1.178	2,*g*								3	23	<25
14 999.3	1.190	1,*u*								2	23	<25
14 999.6	1.190	1,*g*								2	23	<25
14 999.6	1.204	0,g^+								1	23	<25
14 999.7	1.218	1,*u*								0	23	<25

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] Fractions of basis states are mentioned provided they are larger than 25%. Only states with $k=0,1,2$ are printed. The full set of states in the same energy range is available on the WEB site of the Laboratoire de Chimie Physique Moléculaire at the Université libre de Bruxelles (http://www.ulb.ac.be/cpm/)

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
511.5	0.8500	1,g	0	0	0	1	1	0	0	0	1	100
538.6	0.8500	1,u	0	0	0	0	0	1	1	0	1	100
1024.8	0.8520	0,g^+	0	0	0	2	0	0	0	0	2	98
1027.6	0.8520	2,g	0	0	0	2	2	0	0	0	2	100
1041.5	0.8521	0,u^+	0	0	0	1	1	1	−1	0	2	100
1048.7	0.8521	0,u^-	0	0	0	1	−1	1	1	0	2	100
1051.8	0.8521	2,u	0	0	0	1	1	1	1	0	2	100
1070.9	0.8522	0,g^+	0	0	0	0	0	2	0	0	2	98
1078.5	0.8522	2,g	0	0	0	0	0	2	2	0	2	100
1542.5	0.8541	1,g	0	0	0	3	1	0	0	0	3	94
1552.4	0.8542	1,u	0	0	0	2	2	1	−1	0	3	69
		1,u	0	0	0	2	0	1	1	0	3	31
1562.0	0.8542	1,u	0	0	0	2	2	1	−1	0	3	31
		1,u	0	0	0	2	0	1	1	0	3	64
1575.9	0.8543	1,g	0	0	0	1	1	2	0	0	3	46
		1,g	0	0	0	1	−1	2	2	0	3	51
1584.0	0.8543	1,g	0	0	0	1	1	2	0	0	3	48
		1,g	0	0	0	1	−1	2	2	0	3	49
1604.9	0.8543	1,u	0	0	0	0	0	3	1	0	3	95
1764.8	0.8447	0,g^+	0	1	0	0	0	0	0	1	0	100
2061.2	0.8562	0,g^+	0	0	0	4	0	0	0	0	4	81
2064.4	0.8562	2,g	0	0	0	4	2	0	0	0	4	87
2064.7	0.8563	0,u^+	0	0	0	3	1	1	−1	0	4	92
2067.5	0.8563	2,u	0	0	0	3	3	1	−1	0	4	82
2075.4	0.8563	0,u^-	0	0	0	3	−1	1	1	0	4	85
2079.5	0.8563	2,u	0	0	0	3	1	1	1	0	4	70
2080.1	0.8563	0,g^+	0	0	0	2	2	2	−2	0	4	70
2084.7	0.8564	0,g^-	0	0	0	2	−2	2	2	0	4	100
2089.3	0.8564	2,g	0	0	0	2	2	2	0	0	4	49
		2,g	0	0	0	2	0	2	2	0	4	43
2093.8	0.8564	0,g^+	0	0	0	2	2	2	−2	0	4	29
		0,g^+	0	0	0	2	0	2	0	0	4	50
2098.5	0.8564	2,g	0	0	0	2	2	2	0	0	4	37
		2,g	0	0	0	2	0	2	2	0	4	49
2104.9	0.8564	0,u^+	0	0	0	1	1	3	−1	0	4	92
2112.5	0.8564	2,u	0	0	0	1	1	3	1	0	4	38
		2,u	0	0	0	1	−1	3	3	0	4	58
2115.3	0.8564	0,u^-	0	0	0	1	−1	3	1	0	4	85
2120.7	0.8564	2,u	0	0	0	1	1	3	1	0	4	49
		2,u	0	0	0	1	−1	3	3	0	4	41
2133.6	0.8565	0,g^+	0	0	0	0	0	4	0	0	4	88
2140.7	0.8565	2,g	0	0	0	0	0	4	2	0	4	91
2273.2	0.8468	1,g	0	1	0	1	1	0	0	1	1	100
2304.8	0.8469	1,u	0	1	0	0	0	1	1	1	1	100
2439.8	0.8434	0,u^+	0	0	1	0	0	0	0	1	0	100
2581.1	0.8584	1,u	0	0	0	4	2	1	−1	0	5	57
		1,u	0	0	0	4	0	1	1	0	5	27
2582.1	0.8584	1,g	0	0	0	3	1	2	0	0	5	41
		1,g	0	0	0	5	1	0	0	0	5	50
2591.5	0.8584	1,g	0	0	0	3	3	2	−2	0	5	82
2591.6	0.8584	1,u	0	0	0	4	0	1	1	0	5	43
2597.4	0.8584	1,g	0	0	0	3	−1	2	2	0	5	67
2607.8	0.8584	1,g	0	0	0	3	1	2	0	0	5	31
		1,g	0	0	0	5	1	0	0	0	5	29
2611.4	0.8585	1,u	0	0	0	2	−2	3	3	0	5	50
2616.8	0.8585	1,u	0	0	0	2	2	3	−1	0	5	40
		1,u	0	0	0	2	−2	3	3	0	5	44
2627.1	0.8585	1,u	0	0	0	2	0	3	1	0	5	30
2636.7	0.8586	1,g	0	0	0	1	1	4	0	0	5	37
		1,g	0	0	0	1	−1	4	2	0	5	50
2648.3	0.8586	1,g	0	0	0	1	1	4	0	0	5	39
		1,g	0	0	0	1	−1	4	2	0	5	33

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
2664.5	0.8586	1,u	0	0	0	0	0	5	1	0	5	80
2704.9	0.8423	0,g^+	1	0	0	0	0	0	0	1	0	100
2783.5	0.8489	0,g^+	0	1	0	2	0	0	0	1	2	98
2786.1	0.8489	2,g	0	1	0	2	2	0	0	1	2	100
2804.5	0.8490	0,u^+	0	1	0	1	1	1	−1	1	2	100
2811.6	0.8490	0,u^-	0	1	0	1	−1	1	1	1	2	100
2814.8	0.8490	2,u	0	1	0	1	1	1	1	1	2	100
2838.1	0.8491	0,g^+	0	1	0	0	0	2	0	1	2	98
2846.0	0.8491	2,g	0	1	0	0	0	2	2	1	2	100
2945.5	0.8455	1,u	0	0	1	1	1	0	0	1	1	100
2973.1	0.8455	1,g	0	0	1	0	0	1	1	1	1	100
3098.0	0.8605	0,u^+	0	0	0	3	1	3	−1	0	6	35
		0,u^+	0	0	0	5	1	1	−1	0	6	61
3098.6	0.8605	0,g^+	0	0	0	4	0	2	0	0	6	55
3100.6	0.8605	2,u	0	0	0	3	3	3	−1	0	6	28
		2,u	0	0	0	5	3	1	−1	0	6	59
3101.3	0.8605	2,g	0	0	0	4	4	2	−2	0	6	54
		2,g	0	0	0	4	2	2	0	0	6	34
3103.9	0.8606	0,u^-	0	0	0	3	−1	3	1	0	6	51
		0,u^-	0	0	0	5	−1	1	1	0	6	36
3105.9	0.8605	2,g	0	0	0	4	4	2	−2	0	6	42
3106.0	0.8606	0,g^+	0	0	0	4	2	2	−2	0	6	61
3107.1	0.8606	0,g^-	0	0	0	2	−2	4	2	0	6	26
		0,g^-	0	0	0	4	−2	2	2	0	6	74
3109.5	0.8606	2,u	0	0	0	3	1	3	1	0	6	42
		2,u	0	0	0	5	1	1	1	0	6	36
3114.9	0.8606	0,u^+	0	0	0	3	3	3	−3	0	6	87
3115.9	0.8606	2,g	0	0	0	2	0	4	2	0	6	27
		2,g	0	0	0	4	0	2	2	0	6	63
3116.1	0.8606	0,u^-	0	0	0	3	−3	3	3	0	6	98
3124.8	0.8605	0,g^+	0	0	0	6	0	0	0	0	6	68
3126.2	0.8606	2,u	0	0	0	3	3	3	−1	0	6	29
		2,u	0	0	0	3	−1	3	3	0	6	35
3126.5	0.8606	0,u^+	0	0	0	3	1	3	−1	0	6	39
		0,u^+	0	0	0	5	1	1	−1	0	6	33
3128.2	0.8605	2,g	0	0	0	6	2	0	0	0	6	66
3130.6	0.8606	2,u	0	0	0	3	3	3	−1	0	6	29
		2,u	0	0	0	3	−1	3	3	0	6	43
3139.0	0.8606	0,u^-	0	0	0	1	−1	5	1	0	6	32
		0,u^-	0	0	0	5	−1	1	1	0	6	56
3139.0	0.8606	0,g^+	0	0	0	2	2	4	−2	0	6	59
3143.5	0.8606	2,u	0	0	0	1	1	5	1	0	6	25
		2,u	0	0	0	5	1	1	1	0	6	41
3144.5	0.8607	2,g	0	0	0	2	−2	4	4	0	6	73
3145.8	0.8606	0,g^-	0	0	0	2	−2	4	2	0	6	74
		0,g^-	0	0	0	4	−2	2	2	0	6	26
3151.4	0.8606	2,g	0	0	0	2	2	4	0	0	6	36
3157.2	0.8606	0,g^+	0	0	0	4	0	2	0	0	6	29
3162.3	0.8606	2,g								0	6	<25
3164.1	0.8607	0,u^+	0	0	0	1	1	5	−1	0	6	80
3170.7	0.8607	2,u	0	0	0	1	1	5	1	0	6	29
		2,u	0	0	0	1	−1	5	3	0	6	55
3178.1	0.8607	0,u^-	0	0	0	1	−1	5	1	0	6	55
		0,u^-	0	0	0	3	−1	3	1	0	6	36
3183.6	0.8607	2,u	0	0	0	1	1	5	1	0	6	36
3191.2	0.8608	0,g^+	0	0	0	0	0	6	0	0	6	68
3197.8	0.8608	2,g	0	0	0	0	0	6	2	0	6	72
3201.0	0.8444	1,g	1	0	0	1	1	0	0	1	1	100
3235.5	0.8445	1,u	1	0	0	0	0	1	1	1	1	100
3298.3	0.8510	1,g	0	1	0	3	1	0	0	1	3	96
3312.3	0.8511	1,u	0	1	0	2	2	1	−1	1	3	70
		1,u	0	1	0	2	0	1	1	1	3	30
3322.2	0.8511	1,u	0	1	0	2	2	1	−1	1	3	30
		1,u	0	1	0	2	0	1	1	1	3	67

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
3340.0	0.8511	1,g	0	1	0	1	1	2	0	1	3	50
		1,g	0	1	0	1	−1	2	2	1	3	49
3348.1	0.8511	1,g	0	1	0	1	1	2	0	1	3	47
		1,g	0	1	0	1	−1	2	2	1	3	51
3373.2	0.8512	1,u	0	1	0	0	0	3	1	1	3	96
3452.9	0.8476	0,u^+	0	0	1	2	0	0	0	1	2	98
3455.7	0.8476	2,u	0	0	1	2	2	0	0	1	2	100
3470.1	0.8476	0,g^+	0	0	1	1	1	1	−1	1	2	100
3477.3	0.8476	0,g^-	0	0	1	1	−1	1	1	1	2	100
3480.4	0.8476	2,g	0	0	1	1	1	1	1	1	2	100
3499.9	0.8477	0,u^+	0	0	1	0	0	2	0	1	2	98
3507.7	0.8477	2,u	0	0	1	0	0	2	2	1	2	100
3521.0	0.8416	0,g^+	0	2	0	0	0	0	0	2	0	100
3614.0	0.8627	1,u	0	0	0	4	2	3	−1	0	7	41
3614.0	0.8627	1,g	0	0	0	3	1	4	0	0	7	36
		1,g	0	0	0	5	1	2	0	0	7	34
3616.4	0.8627	1,g	0	0	0	3	3	4	−2	0	7	31
		1,g	0	0	0	5	3	2	−2	0	7	58
3617.2	0.8627	1,u	0	0	0	4	0	3	1	0	7	38
3620.8	0.8627	1,u	0	0	0	4	4	3	−3	0	7	96
3622.3	0.8627	1,g	0	0	0	3	−1	4	2	0	7	37
		1,g	0	0	0	5	−1	2	2	0	7	43
3630.4	0.8627	1,u	0	0	0	4	−2	3	3	0	7	68
3641.7	0.8628	1,g	0	0	0	3	−3	4	4	0	7	91
3642.9	0.8626	1,u	0	0	0	6	2	1	−1	0	7	39
3647.6	0.8627	1,g	0	0	0	3	1	4	0	0	7	26
3651.1	0.8626	1,g	0	0	0	3	3	4	−2	0	7	27
		1,g	0	0	0	7	1	0	0	0	7	42
3655.7	0.8627	1,u	0	0	0	6	0	1	1	0	7	40
3658.2	0.8627	1,g	0	0	0	5	−1	2	2	0	7	35
3669.0	0.8628	1,u	0	0	0	2	−2	5	3	0	7	42
3672.5	0.8627	1,g	0	0	0	5	1	2	0	0	7	28
		1,g	0	0	0	7	1	0	0	0	7	27
3677.0	0.8628	1,u	0	0	0	2	2	5	−1	0	7	32
3689.6	0.8628	1,u	0	0	0	0	0	7	1	0	7	30
3694.2	0.8629	1,g	0	0	0	1	1	6	0	0	7	31
		1,g	0	0	0	1	−1	6	2	0	7	42
3699.0	0.8465	0,g^+	1	0	0	2	0	0	0	1	2	99
3701.6	0.8465	2,g	1	0	0	2	2	0	0	1	2	100
3710.3	0.8628	1,g								0	7	<25
3720.6	0.8629	1,u	0	0	0	0	0	7	1	0	7	56
3722.9	0.8465	0,u^+	1	0	0	1	1	1	−1	1	2	100
3730.1	0.8465	0,u^-	1	0	0	1	−1	1	1	1	2	100
3733.2	0.8465	2,u	1	0	0	1	1	1	1	1	2	100
3759.5	0.8466	0,g^+	1	0	0	0	0	2	0	1	2	99
3767.4	0.8466	2,g	1	0	0	0	0	2	2	1	2	100
3814.7	0.8531	0,g^+	0	1	0	4	0	0	0	1	4	89
3817.5	0.8531	2,g	0	1	0	4	2	0	0	1	4	92
3821.9	0.8532	0,u^+	0	1	0	3	1	1	−1	1	4	95
3824.2	0.8531	2,u	0	1	0	3	3	1	−1	1	4	83
3833.2	0.8532	0,u^-	0	1	0	3	−1	1	1	1	4	89
3837.1	0.8532	2,u	0	1	0	3	1	1	1	1	4	75
3840.8	0.8532	0,g^+	0	1	0	2	2	2	−2	1	4	67
		0,g^+	0	1	0	2	0	2	0	1	4	28
3845.8	0.8532	0,g^-	0	1	0	2	−2	2	2	1	4	100
3850.0	0.8532	2,g	0	1	0	2	2	2	0	1	4	58
		2,g	0	1	0	2	0	2	2	1	4	37
3854.9	0.8532	0,g^+	0	1	0	2	2	2	−2	1	4	32
		0,g^+	0	1	0	2	0	2	0	1	4	54
3859.8	0.8532	2,g	0	1	0	2	2	2	0	1	4	33
		2,g	0	1	0	2	0	2	2	1	4	57
3870.0	0.8533	0,u^+	0	1	0	1	1	3	−1	1	4	95
3877.7	0.8533	2,u	0	1	0	1	1	3	1	1	4	45
		2,u	0	1	0	1	−1	3	3	1	4	52

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
3879.7	0.8533	$0,u^-$	0	1	0	1	−1	3	1	1	4	89
3885.6	0.8533	$2,u$	0	1	0	1	1	3	1	1	4	47
		$2,u$	0	1	0	1	−1	3	3	1	4	47
3902.7	0.8534	$0,g^+$	0	1	0	0	0	4	0	1	4	92
3910.0	0.8534	$2,g$	0	1	0	0	0	4	2	1	4	94
3964.8	0.8496	$1,u$	0	0	1	3	1	0	0	1	3	94
3975.1	0.8497	$1,g$	0	0	1	2	2	1	−1	1	3	69
		$1,g$	0	0	1	2	0	1	1	1	3	31
3984.8	0.8497	$1,g$	0	0	1	2	2	1	−1	1	3	31
		$1,g$	0	0	1	2	0	1	1	1	3	65
3999.1	0.8498	$1,u$	0	0	1	1	1	2	0	1	3	47
		$1,u$	0	0	1	1	−1	2	2	1	3	51
4007.2	0.8498	$1,u$	0	0	1	1	1	2	0	1	3	48
		$1,u$	0	0	1	1	−1	2	2	1	3	49
4026.2	0.8437	$1,g$	0	2	0	1	1	0	0	2	1	100
4028.6	0.8499	$1,g$	0	0	1	0	0	3	1	1	3	95
4062.2	0.8438	$1,u$	0	2	0	0	0	1	1	2	1	100
4115.4	0.8649	$0,u^-$	0	0	0	3	−1	5	1	0	8	43
		$0,u^-$	0	0	0	5	−1	3	1	0	8	26
4115.4	0.8649	$0,g^+$								0	8	<25
4121.5	0.8649	$2,g$	0	0	0	4	2	4	0	0	8	25
4121.5	0.8649	$2,u$								0	8	<25
4128.6	0.8648	$2,u$	0	0	0	5	5	3	−3	0	8	89
4128.7	0.8648	$0,u^+$	0	0	0	3	3	5	−3	0	8	28
		$0,u^+$	0	0	0	5	3	3	−3	0	8	25
4128.8	0.8648	$0,g^-$	0	0	0	4	−2	4	2	0	8	44
4130.7	0.8648	$2,g$	0	0	0	4	4	4	−2	0	8	38
		$2,g$	0	0	0	6	4	2	−2	0	8	35
4134.5	0.8648	$0,g^+$								0	8	<25
4134.8	0.8648	$2,u$	0	0	0	5	3	3	−1	0	8	34
4136.1	0.8648	$0,u^-$	0	0	0	3	−3	5	3	0	8	32
		$0,u^-$	0	0	0	5	−3	3	3	0	8	55
4137.9	0.8648	$0,u^+$	0	0	0	5	3	3	−3	0	8	34
		$0,u^+$	0	0	0	5	1	3	−1	0	8	40
4140.6	0.8648	$2,g$								0	8	<25
4141.1	0.8648	$0,g^-$	0	0	0	4	−4	4	4	0	8	85
4141.5	0.8648	$0,g^+$	0	0	0	4	4	4	−4	0	8	72
4149.0	0.8648	$2,u$	0	0	0	5	−1	3	3	0	8	34
4159.8	0.8649	$2,g$	0	0	0	4	−2	4	4	0	8	55
4161.0	0.8648	$2,g$	0	0	0	4	4	4	−2	0	8	41
		$2,g$	0	0	0	6	4	2	−2	0	8	38
4163.0	0.8648	$0,g^+$								0	8	<25
4163.3	0.8647	$0,u^+$	0	0	0	7	1	1	−1	0	8	67
4164.9	0.8647	$2,u$	0	0	0	7	3	1	−1	0	8	57
4169.2	0.8648	$0,g^+$	0	0	0	6	2	2	−2	0	8	28
4169.3	0.8648	$0,g^-$	0	0	0	2	−2	6	2	0	8	35
		$0,g^-$	0	0	0	6	−2	2	2	0	8	63
4169.5	0.8648	$0,u^-$	0	0	0	1	−1	7	1	0	8	28
		$0,u^-$	0	0	0	7	−1	1	1	0	8	37
4170.4	0.8649	$2,u$	0	0	0	3	−3	5	5	0	8	84
4171.8	0.8649	$0,u^+$	0	0	0	3	3	5	−3	0	8	49
4172.0	0.8648	$2,g$	0	0	0	2	2	6	0	0	8	28
		$2,g$	0	0	0	6	2	2	0	0	8	35
4173.7	0.8649	$0,u^-$	0	0	0	3	−3	5	3	0	8	58
		$0,u^-$	0	0	0	5	−3	3	3	0	8	36
4175.4	0.8648	$2,u$	0	0	0	7	1	1	1	0	8	37
4178.1	0.8648	$2,g$	0	0	0	6	0	2	2	0	8	55
4184.6	0.8649	$2,u$								0	8	<25
4187.6	0.8648	$0,u^+$	0	0	0	5	1	3	−1	0	8	30
4190.6	0.8403	$0,u^+$	0	1	1	0	0	0	0	2	0	100
4191.6	0.8648	$2,u$	0	0	0	5	−1	3	3	0	8	29
4194.0	0.8647	$0,g^+$	0	0	0	8	0	0	0	0	8	65
4196.3	0.8649	$0,g^+$	0	0	0	2	2	6	−2	0	8	48
4197.3	0.8647	$2,g$	0	0	0	8	2	0	0	0	8	70

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
4200.7	0.8650	2,g	0	0	0	2	−2	6	4	0	8	49
4201.6	0.8485	1,g	1	0	0	3	1	0	0	1	3	97
4204.4	0.8648	0,u^-	0	0	0	1	−1	7	1	0	8	30
		0,u^-	0	0	0	7	−1	1	1	0	8	52
4205.0	0.8649	0,g^-	0	0	0	2	−2	6	2	0	8	45
		0,g^-	0	0	0	4	−2	4	2	0	8	40
4209.0	0.8648	2,u	0	0	0	7	1	1	1	0	8	36
4211.1	0.8649	2,g	0	0	0	2	2	6	0	0	8	28
4218.4	0.8486	1,u	1	0	0	2	2	1	−1	1	3	70
		1,u	1	0	0	2	0	1	1	1	3	29
4219.1	0.8649	0,g^+	0	0	0	0	0	8	0	0	8	36
4220.4	0.8650	0,u^+	0	0	0	1	1	7	−1	0	8	64
4224.3	0.8649	2,g	0	0	0	0	0	8	2	0	8	35
4226.5	0.8650	2,u	0	0	0	1	1	7	1	0	8	25
		2,u	0	0	0	1	−1	7	3	0	8	42
4228.5	0.8486	1,u	1	0	0	2	2	1	−1	1	3	29
		1,u	1	0	0	2	0	1	1	1	3	68
4239.6	0.8649	0,u^-	0	0	0	1	−1	7	1	0	8	27
		0,u^-	0	0	0	3	−1	5	1	0	8	36
		0,u^-	0	0	0	5	−1	3	1	0	8	25
4245.2	0.8649	2,u								0	8	<25
4246.8	0.8650	0,g^+	0	0	0	0	0	8	0	0	8	40
		0,g^+	0	0	0	2	0	6	0	0	8	26
4249.1	0.8487	1,g	1	0	0	1	1	2	0	1	3	51
		1,g	1	0	0	1	−1	2	2	1	3	47
4253.0	0.8650	2,g	0	0	0	0	0	8	2	0	8	43
		2,g	0	0	0	2	0	6	2	0	8	25
4257.1	0.8487	1,g	1	0	0	1	1	2	0	1	3	46
		1,g	1	0	0	1	−1	2	2	1	3	53
4285.2	0.8488	1,u	1	0	0	0	0	3	1	1	3	97
4334.7	0.8552	1,g	0	1	0	5	1	0	0	1	5	73
4335.8	0.8552	1,u	0	1	0	4	2	1	−1	1	5	61
		1,u	0	1	0	4	0	1	1	1	5	29
4347.8	0.8553	1,u	0	1	0	4	0	1	1	1	5	51
4348.6	0.8553	1,g	0	1	0	3	3	2	−2	1	5	78
4355.7	0.8553	1,g	0	1	0	3	−1	2	2	1	5	61
4365.8	0.8553	1,g	0	1	0	3	1	2	0	1	5	40
4373.3	0.8554	1,u	0	1	0	2	2	3	−1	1	5	26
		1,u	0	1	0	2	0	3	1	1	5	27
		1,u	0	1	0	2	−2	3	3	1	5	41
4378.6	0.8554	1,u	0	1	0	2	2	3	−1	1	5	41
		1,u	0	1	0	2	−2	3	3	1	5	51
4388.4	0.8554	1,u	0	1	0	2	0	3	1	1	5	40
4402.7	0.8554	1,g	0	1	0	1	1	4	0	1	5	41
		1,g	0	1	0	1	−1	4	2	1	5	50
4413.0	0.8554	1,g	0	1	0	1	1	4	0	1	5	41
		1,g	0	1	0	1	−1	4	2	1	5	38
4434.3	0.8555	1,u	0	1	0	0	0	5	1	1	5	86
4451.6	0.8392	0,g^+	1	1	0	0	0	0	0	2	0	100
4477.7	0.8517	0,u^+	0	0	1	4	0	0	0	1	4	83
4480.9	0.8517	2,u	0	0	1	4	2	0	0	1	4	88
4481.6	0.8518	0,g^+	0	0	1	3	1	1	−1	1	4	93
4484.3	0.8518	2,g	0	0	1	3	3	1	−1	1	4	82
4492.4	0.8518	0,g^-	0	0	1	3	−1	1	1	1	4	85
4496.4	0.8518	2,g	0	0	1	3	1	1	1	1	4	71
4497.4	0.8519	0,u^+	0	0	1	2	2	2	−2	1	4	69
4502.0	0.8519	0,u^-	0	0	1	2	−2	2	2	1	4	100
4506.6	0.8519	2,u	0	0	1	2	2	2	0	1	4	51
		2,u	0	0	1	2	0	2	2	1	4	42
4511.2	0.8519	0,u^+	0	0	1	2	2	2	−2	1	4	29
		0,u^+	0	0	1	2	0	2	0	1	4	50
4515.9	0.8519	2,u	0	0	1	2	2	2	0	1	4	36
		2,u	0	0	1	2	0	2	2	1	4	50
4522.7	0.8519	0,g^+	0	0	1	1	1	3	−1	1	4	93

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
4530.3	0.8519	2,*g*	0	0	1	1	1	3	1	1	4	39
		2,*g*	0	0	1	1	−1	3	3	1	4	58
4533.0	0.8519	0,g^-	0	0	1	1	−1	3	1	1	4	85
4533.5	0.8458	0,g^+	0	2	0	2	0	0	0	2	2	99
4536.0	0.8458	2,*g*	0	2	0	2	2	0	0	2	2	100
4538.5	0.8519	2,*g*	0	0	1	1	1	3	1	1	4	49
		2,*g*	0	0	1	1	−1	3	3	1	4	42
4551.8	0.8520	0,u^+	0	0	1	0	0	4	0	1	4	89
4558.8	0.8459	0,u^+	0	2	0	1	1	1	−1	2	2	100
4559.0	0.8520	2,*u*	0	0	1	0	0	4	2	1	4	91
4566.0	0.8459	0,u^-	0	2	0	1	−1	1	1	2	2	100
4569.1	0.8459	2,*u*	0	2	0	1	1	1	1	2	2	100
4596.8	0.8459	0,g^+	0	2	0	0	0	2	0	2	2	99
4604.7	0.8459	2,*g*	0	2	0	0	0	2	2	2	2	100
4612.5	0.8670	1,*u*								0	9	<25
4612.5	0.8670	1,*g*								0	9	<25
4633.5	0.8670	1,*g*	0	0	0	5	5	4	−4	0	9	28
4633.8	0.8670	1,*u*	0	0	0	4	4	5	−3	0	9	28
4642.1	0.8669	1,*g*	0	0	0	5	5	4	−4	0	9	63
4646.2	0.8669	1,*u*								0	9	<25
4652.0	0.8669	1,*g*								0	9	<25
4656.4	0.8669	1,*u*	0	0	0	4	−4	5	5	0	9	38
4664.5	0.8669	1,*g*	0	0	0	5	−1	4	2	0	9	26
		1,*g*	0	0	0	5	−3	4	4	0	9	28
4667.0	0.8670	1,*u*	0	0	0	4	−4	5	5	0	9	45
4677.8	0.8669	1,*u*	0	0	0	4	4	5	−3	0	9	40
		1,*u*	0	0	0	6	4	3	−3	0	9	46
4679.5	0.8669	1,*g*	0	0	0	3	3	6	−2	0	9	25
		1,*g*	0	0	0	7	3	2	−2	0	9	47
4680.2	0.8670	1,*u*								0	9	<25
4680.8	0.8669	1,*g*	0	0	0	7	1	2	0	0	9	39
4684.7	0.8669	1,*u*								0	9	<25
4686.2	0.8669	1,*g*	0	0	0	7	−1	2	2	0	9	42
4691.8	0.8670	1,*u*	0	0	0	6	−2	3	3	0	9	39
4693.1	0.8423	1,*u*	0	1	1	1	1	0	0	2	1	100
4699.0	0.8670	1,*g*	0	0	0	3	−3	6	4	0	9	44
4706.1	0.8506	0,g^+	1	0	0	4	0	0	0	1	4	92
4706.3	0.8670	1,*g*	0	0	0	3	3	6	−2	0	9	31
4707.0	0.8668	1,*u*	0	0	0	8	2	1	−1	0	9	38
4708.7	0.8506	2,*g*	1	0	0	4	2	0	0	1	4	94
4716.0	0.8507	0,u^+	1	0	0	3	1	1	−1	1	4	96
4718.0	0.8507	2,*u*	1	0	0	3	3	1	−1	1	4	83
4718.6	0.8669	1,*g*								0	9	<25
4723.0	0.8668	1,*g*	0	0	0	9	1	0	0	0	9	39
4723.4	0.8669	1,*u*	0	0	0	8	0	1	1	0	9	33
4725.1	0.8424	1,*g*	0	1	1	0	0	1	1	2	1	100
4725.3	0.8671	1,*u*	0	0	0	2	−2	7	3	0	9	30
4727.6	0.8507	0,u^-	1	0	0	3	−1	1	1	1	4	91
4731.3	0.8507	2,*u*	1	0	0	3	1	1	1	1	4	77
4735.7	0.8670	1,*u*								0	9	<25
4737.5	0.8508	0,g^+	1	0	0	2	2	2	−2	1	4	66
		0,g^+	1	0	0	2	0	2	0	1	4	30
4741.9	0.8668	1,*g*	0	0	0	9	1	0	0	0	9	53
4742.6	0.8508	0,g^-	1	0	0	2	−2	2	2	1	4	100
4746.6	0.8508	2,*g*	1	0	0	2	2	2	0	1	4	62
		2,*g*	1	0	0	2	0	2	2	1	4	34
4749.3	0.8671	1,*g*	0	0	0	1	1	8	0	0	9	25
		1,*g*	0	0	0	1	−1	8	2	0	9	31
4751.4	0.8670	1,*u*	0	0	0	0	0	9	1	0	9	37
4751.8	0.8508	0,g^+	1	0	0	2	2	2	−2	1	4	33
		0,g^+	1	0	0	2	0	2	0	1	4	56
4756.7	0.8508	2,*g*	1	0	0	2	2	2	0	1	4	31
		2,*g*	1	0	0	2	0	2	2	1	4	61
4769.5	0.8508	0,u^+	1	0	0	1	1	3	−1	1	4	96

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
4771.9	0.8670	$1,g$								0	9	<25
4776.5	0.8671	$1,u$	0	0	0	0	0	9	1	0	9	26
4777.4	0.8508	$2,u$	1	0	0	1	1	3	1	1	4	48
		$2,u$	1	0	0	1	−1	3	3	1	4	49
4779.0	0.8508	$0,u^-$	1	0	0	1	−1	3	1	1	4	91
4785.1	0.8508	$2,u$	1	0	0	1	1	3	1	1	4	45
		$2,u$	1	0	0	1	−1	3	3	1	4	50
4805.1	0.8509	$0,g^+$	1	0	0	0	0	4	0	1	4	93
4812.6	0.8509	$2,g$	1	0	0	0	0	4	2	1	4	95
4849.7	0.8389	$0,g^+$	0	0	2	0	0	0	0	2	0	100
4851.3	0.8574	$0,u^+$	0	1	0	5	1	1	−1	1	6	76
4852.6	0.8574	$0,g^+$	0	1	0	4	0	2	0	1	6	50
		$0,g^+$	0	1	0	6	0	0	0	1	6	33
4853.1	0.8573	$2,u$	0	1	0	5	3	1	−1	1	6	67
4855.2	0.8574	$2,g$	0	1	0	4	4	2	−2	1	6	34
		$2,g$	0	1	0	4	2	2	0	1	6	39
4859.6	0.8574	$2,g$	0	1	0	4	4	2	−2	1	6	61
		$2,g$	0	1	0	6	2	0	0	1	6	25
4860.2	0.8574	$0,u^-$	0	1	0	3	−1	3	1	1	6	41
		$0,u^-$	0	1	0	5	−1	1	1	1	6	51
4861.5	0.8574	$0,g^+$	0	1	0	4	2	2	−2	1	6	69
4863.9	0.8574	$0,g^-$	0	1	0	4	−2	2	2	1	6	81
4865.2	0.8574	$2,u$	0	1	0	3	1	3	1	1	6	32
		$2,u$	0	1	0	5	1	1	1	1	6	48
4872.3	0.8574	$2,g$	0	1	0	4	0	2	2	1	6	61
4873.9	0.8575	$0,u^+$	0	1	0	3	3	3	−3	1	6	82
4875.4	0.8575	$0,u^-$	0	1	0	3	−3	3	3	1	6	97
4877.3	0.8574	$0,g^+$	0	1	0	6	0	0	0	1	6	47
4881.0	0.8574	$2,g$	0	1	0	6	2	0	0	1	6	38
4884.3	0.8574	$2,u$	0	1	0	3	3	3	−1	1	6	50
4884.7	0.8575	$0,u^+$	0	1	0	3	1	3	−1	1	6	50
4890.0	0.8575	$2,u$	0	1	0	3	−1	3	3	1	6	64
4896.3	0.8574	$0,u^-$	0	1	0	1	−1	5	1	1	6	27
		$0,u^-$	0	1	0	3	−1	3	1	1	6	27
		$0,u^-$	0	1	0	5	−1	1	1	1	6	44
4901.0	0.8574	$2,u$	0	1	0	5	1	1	1	1	6	31
4901.4	0.8575	$0,g^+$	0	1	0	2	2	4	−2	1	6	61
		$0,g^+$	0	1	0	2	0	4	0	1	6	27
4907.6	0.8575	$0,g^-$	0	1	0	2	−2	4	2	1	6	81
4908.1	0.8575	$2,g$	0	1	0	2	−2	4	4	1	6	64
4913.5	0.8575	$2,g$	0	1	0	2	2	4	0	1	6	42
		$2,g$	0	1	0	2	−2	4	4	1	6	30
4918.4	0.8575	$0,g^+$	0	1	0	4	0	2	0	1	6	25
4923.7	0.8575	$2,g$	0	1	0	2	0	4	2	1	6	26
4930.7	0.8576	$0,u^+$	0	1	0	1	1	5	−1	1	6	86
4937.7	0.8576	$2,u$	0	1	0	1	1	5	1	1	6	34
		$2,u$	0	1	0	1	−1	5	3	1	6	55
4942.4	0.8576	$0,u^-$	0	1	0	1	−1	5	1	1	6	66
		$0,u^-$	0	1	0	3	−1	3	1	1	6	29
4944.5	0.8412	$1,g$	1	1	0	1	1	0	0	2	1	100
4948.3	0.8576	$2,u$	0	1	0	1	1	5	1	1	6	40
		$2,u$	0	1	0	1	−1	5	3	1	6	29
4961.2	0.8577	$0,g^+$	0	1	0	0	0	6	0	1	6	79
4968.1	0.8577	$2,g$	0	1	0	0	0	6	2	1	6	81
4983.5	0.8413	$1,u$	1	1	0	0	0	1	1	2	1	100
4992.2	0.8539	$1,g$	0	0	1	4	2	1	−1	1	5	57
		$1,g$	0	0	1	4	0	1	1	1	5	28
4993.0	0.8539	$1,u$	0	0	1	3	1	2	0	1	5	39
		$1,u$	0	0	1	5	1	0	0	1	5	53
5002.8	0.8539	$1,u$	0	0	1	3	3	2	−2	1	5	81
5002.9	0.8539	$1,g$	0	0	1	4	0	1	1	1	5	45
5008.9	0.8540	$1,u$	0	0	1	3	−1	2	2	1	5	67
5019.2	0.8539	$1,u$	0	0	1	3	1	2	0	1	5	32
		$1,u$	0	0	1	5	1	0	0	1	5	27

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
5023.3	0.8540	1,g	0	0	1	2	−2	3	3	1	5	48
5028.7	0.8540	1,g	0	0	1	2	2	3	−1	1	5	41
		1,g	0	0	1	2	−2	3	3	1	5	45
5038.9	0.8540	1,g	0	0	1	2	0	3	1	1	5	31
5045.3	0.8479	1,g	0	2	0	3	1	0	0	2	3	97
5049.1	0.8541	1,u	0	0	1	1	1	4	0	1	5	38
		1,u	0	0	1	1	−1	4	2	1	5	50
5060.5	0.8541	1,u	0	0	1	1	1	4	0	1	5	39
		1,u	0	0	1	1	−1	4	2	1	5	34
5063.5	0.8479	1,u	0	2	0	2	2	1	−1	2	3	71
		1,u	0	2	0	2	0	1	1	2	3	29
5073.6	0.8479	1,u	0	2	0	2	2	1	−1	2	3	29
		1,u	0	2	0	2	0	1	1	2	3	68
5077.3	0.8542	1,g	0	0	1	0	0	5	1	1	5	81
5095.5	0.8480	1,g	0	2	0	1	1	2	0	2	3	52
		1,g	0	2	0	1	−1	2	2	2	3	47
5097.6	0.8378	0,u^+	1	0	1	0	0	0	0	2	0	100
5099.1	0.8692	0,u^-	0	0	0	3	−1	7	1	0	10	37
5099.1	0.8692	0,g^+								0	10	<25
5103.5	0.8480	1,g	0	2	0	1	1	2	0	2	3	45
		1,g	0	2	0	1	−1	2	2	2	3	53
5106.4	0.8692	2,g								0	10	<25
5106.4	0.8692	2,u								0	10	<25
5130.4	0.8691	0,u^+	0	0	0	3	3	7	−3	0	10	28
		0,u^+	0	0	0	5	3	5	−3	0	10	30
5130.6	0.8691	0,g^-	0	0	0	4	−4	6	4	0	10	29
		0,g^-	0	0	0	4	−2	6	2	0	10	28
5133.0	0.8481	1,u	0	2	0	0	0	3	1	2	3	97
5135.3	0.8691	2,g	0	0	0	6	6	4	−4	0	10	36
5136.4	0.8691	2,u	0	0	0	5	5	5	−3	0	10	31
5146.7	0.8691	2,g	0	0	0	6	6	4	−4	0	10	57
5147.0	0.8691	0,u^-	0	0	0	5	−5	5	5	0	10	69
5150.1	0.8691	0,g^+	0	0	0	4	4	6	−4	0	10	46
		0,g^+	0	0	0	6	4	4	−4	0	10	36
5155.5	0.8691	2,u	0	0	0	5	5	5	−3	0	10	29
5155.6	0.8691	0,u^+	0	0	0	5	5	5	−5	0	10	80
5164.6	0.8691	2,g								0	10	<25
5166.2	0.8691	0,g^-	0	0	0	6	−4	4	4	0	10	36
5167.3	0.8691	0,u^-	0	0	0	5	−5	5	5	0	10	29
		0,u^-	0	0	0	5	−3	5	3	0	10	41
5175.1	0.8691	2,u	0	0	0	5	−3	5	5	0	10	25
5181.1	0.8691	0,g^+	0	0	0	6	2	4	−2	0	10	32
5181.3	0.8691	0,u^-	0	0	0	1	−1	9	1	0	10	28
		0,u^-	0	0	0	7	−1	3	1	0	10	27
5181.7	0.8691	2,g	0	0	0	4	−4	6	6	0	10	51
5182.9	0.8690	0,g^+	0	0	0	6	0	4	0	0	10	29
5183.4	0.8690	0,u^+	0	0	0	5	1	5	−1	0	10	30
5185.4	0.8690	2,u	0	0	0	7	5	3	−3	0	10	52
5187.4	0.8691	2,g								0	10	<25
5188.6	0.8691	2,u								0	10	<25
5192.0	0.8691	0,g^-	0	0	0	4	−4	6	4	0	10	27
		0,g^-	0	0	0	6	−4	4	4	0	10	33
5193.8	0.8691	0,u^+	0	0	0	3	3	7	−3	0	10	32
		0,u^+	0	0	0	7	3	3	−3	0	10	32
5194.3	0.8691	0,g^+	0	0	0	4	4	6	−4	0	10	39
		0,g^+	0	0	0	6	4	4	−4	0	10	32
5196.0	0.8690	2,g	0	0	0	8	4	2	−2	0	10	30
5197.5	0.8444	0,u^+	0	1	1	2	0	0	0	2	2	98
5198.1	0.8691	2,u								0	10	<25
5199.4	0.8690	0,u^-	0	0	0	3	−3	7	3	0	10	30
		0,u^-	0	0	0	7	−3	3	3	0	10	52
5200.0	0.8691	2,g								0	10	<25
5200.1	0.8444	2,u	0	1	1	2	2	0	0	2	2	100
5200.3	0.8691	0,g^-	0	0	0	6	−2	4	2	0	10	27

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
5201.9	0.8691	2,u								0	10	<25
5204.4	0.8690	0,u^+	0	0	0	7	1	3	−1	0	10	37
5206.3	0.8690	2,g								0	10	<25
5208.6	0.8690	0,g^+								0	10	<25
5211.1	0.8691	2,u								0	10	<25
5214.6	0.8527	1,g	1	0	0	5	1	0	0	1	5	82
5217.8	0.8528	1,u	1	0	0	4	2	1	−1	1	5	62
		1,u	1	0	0	4	0	1	1	1	5	30
5218.6	0.8690	2,g	0	0	0	8	4	2	−2	0	10	27
5219.0	0.8445	0,g^+	0	1	1	1	1	1	−1	2	2	100
5223.8	0.8690	0,g^+								0	10	<25
5224.1	0.8691	2,g	0	0	0	6	−2	4	4	0	10	27
5226.1	0.8445	0,g^-	0	1	1	1	−1	1	1	2	2	100
5228.5	0.8691	0,u^+	0	0	0	3	3	7	−3	0	10	31
5229.2	0.8445	2,g	0	1	1	1	1	1	1	2	2	100
5229.7	0.8692	2,u	0	0	0	3	−3	7	5	0	10	32
5229.8	0.8691	0,u^-	0	0	0	3	−3	7	3	0	10	32
		0,u^-	0	0	0	5	−3	5	3	0	10	35
5230.6	0.8528	1,u	1	0	0	4	2	1	−1	1	5	26
		1,u	1	0	0	4	0	1	1	1	5	55
5232.7	0.8528	1,g	1	0	0	3	3	2	−2	1	5	76
5233.3	0.8690	0,u^+	0	0	0	9	1	1	−1	0	10	44
5233.9	0.8689	2,u	0	0	0	9	3	1	−1	0	10	47
5234.1	0.8690	0,g^-	0	0	0	2	−2	8	2	0	10	27
		0,g^-	0	0	0	8	−2	2	2	0	10	59
5237.4	0.8691	0,g^+								0	10	<25
5238.2	0.8691	0,u^-	0	0	0	1	−1	9	1	0	10	31
		0,u^-	0	0	0	7	−1	3	1	0	10	26
5238.7	0.8690	2,g	0	0	0	8	2	2	0	0	10	26
5240.4	0.8529	1,g	1	0	0	3	−1	2	2	1	5	59
5242.3	0.8691	2,u								0	10	<25
5244.2	0.8691	2,g	0	0	0	8	0	2	2	0	10	37
5244.3	0.8690	2,u	0	0	0	9	1	1	1	0	10	28
5250.4	0.8690	0,u^+	0	0	0	9	1	1	−1	0	10	35
5250.6	0.8529	1,g	1	0	0	3	1	2	0	1	5	42
		1,g	1	0	0	3	−1	2	2	1	5	26
5251.9	0.8693	0,g^+	0	0	0	2	2	8	−2	0	10	40
5253.1	0.8446	0,u^+	0	1	1	0	0	2	0	2	2	98
5254.0	0.8690	2,u								0	10	<25
5256.8	0.8693	2,g	0	0	0	2	−2	8	4	0	10	28
5260.5	0.8529	1,u	1	0	0	2	2	3	−1	1	5	29
		1,u	1	0	0	2	0	3	1	1	5	29
		1,u	1	0	0	2	−2	3	3	1	5	36
5261.0	0.8446	2,u	0	1	1	0	0	2	2	2	2	100
5263.0	0.8691	0,g^-	0	0	0	4	−2	6	2	0	10	32
		0,g^-	0	0	0	6	−2	4	2	0	10	27
5265.2	0.8385	0,g^+	0	3	0	0	0	0	0	3	0	100
5265.7	0.8529	1,u	1	0	0	2	2	3	−1	1	5	40
		1,u	1	0	0	2	−2	3	3	1	5	54
5269.4	0.8691	2,g								0	10	<25
5269.8	0.8690	0,g^+	0	0	0	0	0	10	0	0	10	26
		0,g^+	0	0	0	10	0	0	0	0	10	41
5274.2	0.8690	0,u^-	0	0	0	9	−1	1	1	0	10	57
5274.3	0.8690	2,g	0	0	0	10	2	0	0	0	10	50
5274.8	0.8693	0,u^+	0	0	0	1	1	9	−1	0	10	47
		0,u^+	0	0	0	3	1	7	−1	0	10	26
5275.4	0.8529	1,u	1	0	0	2	0	3	1	1	5	45
5278.9	0.8690	2,u	0	0	0	9	1	1	1	0	10	40
5280.9	0.8693	2,u	0	0	0	1	1	9	1	0	10	27
5284.5	0.8690	0,g^+	0	0	0	10	0	0	0	0	10	50
5288.4	0.8690	2,g	0	0	0	10	2	0	0	0	10	39
5292.7	0.8530	1,g	1	0	0	1	1	4	0	1	5	44
		1,g	1	0	0	1	−1	4	2	1	5	49
5302.1	0.8690	0,u^-	0	0	0	5	−1	5	1	0	10	25

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,u^-$	0	0	0	7	−1	3	1	0	10	26
5302.4	0.8530	$1,g$	1	0	0	1	1	4	0	1	5	43
		$1,g$	1	0	0	1	−1	4	2	1	5	41
5304.3	0.8691	$0,g^+$								0	10	<25
5307.7	0.8691	$2,u$								0	10	<25
5310.2	0.8691	$2,g$								0	10	<25
5327.1	0.8531	$1,u$	1	0	0	0	0	5	1	1	5	89
5349.4	0.8410	$1,g$	0	0	2	1	1	0	0	2	1	100
5368.8	0.8595	$1,u$	0	1	0	4	2	3	−1	1	7	41
		$1,u$	0	1	0	6	2	1	−1	1	7	42
5369.3	0.8595	$1,g$	0	1	0	5	1	2	0	1	7	49
5371.4	0.8595	$1,g$	0	1	0	5	3	2	−2	1	7	50
5372.7	0.8595	$1,u$	0	1	0	4	0	3	1	1	7	42
		$1,u$	0	1	0	6	0	1	1	1	7	29
5376.9	0.8595	$1,u$	0	1	0	4	4	3	−3	1	7	96
5377.6	0.8411	$1,u$	0	0	2	0	0	1	1	2	1	100
5378.5	0.8595	$1,g$	0	1	0	3	−1	4	2	1	7	32
		$1,g$	0	1	0	5	−1	2	2	1	7	56
5386.3	0.8367	$0,g^+$	2	0	0	0	0	0	0	2	0	100
5388.2	0.8596	$1,u$	0	1	0	4	−2	3	3	1	7	72
5396.5	0.8595	$1,u$	0	1	0	6	2	1	−1	1	7	29
5397.9	0.8594	$1,g$	0	1	0	7	1	0	0	1	7	75
5402.3	0.8596	$1,g$	0	1	0	3	−3	4	4	1	7	90
5407.5	0.8596	$1,g$	0	1	0	3	3	4	−2	1	7	59
5409.9	0.8595	$1,u$	0	1	0	6	0	1	1	1	7	41
5416.5	0.8596	$1,g$	0	1	0	3	−1	4	2	1	7	28
5428.6	0.8596	$1,g$	0	1	0	5	1	2	0	1	7	32
5432.5	0.8597	$1,u$	0	1	0	2	0	5	1	1	7	26
		$1,u$	0	1	0	2	−2	5	3	1	7	43
5438.8	0.8597	$1,u$	0	1	0	2	2	5	−1	1	7	39
		$1,u$	0	1	0	2	−2	5	3	1	7	28
5439.5	0.8433	$0,g^+$	1	1	0	2	0	0	0	2	2	99
5442.0	0.8433	$2,g$	1	1	0	2	2	0	0	2	2	100
5450.3	0.8596	$1,u$	0	1	0	4	0	3	1	1	7	26
5461.4	0.8597	$1,g$	0	1	0	1	1	6	0	1	7	36
		$1,g$	0	1	0	1	−1	6	2	1	7	46
5467.8	0.8434	$0,u^+$	1	1	0	1	1	1	−1	2	2	100
5473.9	0.8597	$1,g$	0	1	0	1	1	6	0	1	7	30
5474.9	0.8434	$0,u^-$	1	1	0	1	−1	1	1	2	2	100
5478.1	0.8434	$2,u$	1	1	0	1	1	1	1	2	2	100
5490.5	0.8598	$1,u$	0	1	0	0	0	7	1	1	7	70
5503.5	0.8560	$0,g^+$	0	0	1	3	1	3	−1	1	6	34
		$0,g^+$	0	0	1	5	1	1	−1	1	6	63
5504.2	0.8560	$0,u^+$	0	0	1	4	0	2	0	1	6	55
5506.0	0.8560	$2,g$	0	0	1	3	3	3	−1	1	6	26
		$2,g$	0	0	1	5	3	1	−1	1	6	60
5506.8	0.8560	$2,u$	0	0	1	4	4	2	−2	1	6	54
		$2,u$	0	0	1	4	2	2	0	1	6	34
5508.7	0.8435	$0,g^+$	1	1	0	0	0	2	0	2	2	99
5509.8	0.8561	$0,g^-$	0	0	1	3	−1	3	1	1	6	50
		$0,g^-$	0	0	1	5	−1	1	1	1	6	38
5511.5	0.8560	$2,u$	0	0	1	4	4	2	−2	1	6	43
5511.8	0.8561	$0,u^+$	0	0	1	4	2	2	−2	1	6	62
5513.0	0.8561	$0,u^-$	0	0	1	2	−2	4	2	1	6	25
		$0,u^-$	0	0	1	4	−2	2	2	1	6	75
5515.3	0.8561	$2,g$	0	0	1	3	1	3	1	1	6	41
		$2,g$	0	0	1	5	1	1	1	1	6	37
5516.7	0.8435	$2,g$	1	1	0	0	0	2	2	2	2	100
5521.0	0.8561	$0,g^+$	0	0	1	3	3	3	−3	1	6	86
5521.8	0.8561	$2,u$	0	0	1	2	0	4	2	1	6	26
		$2,u$	0	0	1	4	0	2	2	1	6	64
5522.2	0.8561	$0,g^-$	0	0	1	3	−3	3	3	1	6	98
5530.0	0.8560	$0,u^+$	0	0	1	6	0	0	0	1	6	67
5532.2	0.8561	$2,g$	0	0	1	3	3	3	−1	1	6	33

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		2,*g*	0	0	1	3	−1	3	3	1	6	32
5532.4	0.8561	0,g^+	0	0	1	3	1	3	−1	1	6	40
		0,g^+	0	0	1	5	1	1	−1	1	6	31
5533.4	0.8560	2,*u*	0	0	1	6	2	0	0	1	6	63
5536.7	0.8561	2,*g*	0	0	1	3	3	3	−1	1	6	27
		2,*g*	0	0	1	3	−1	3	3	1	6	47
5544.8	0.8561	0,g^-	0	0	1	1	−1	5	1	1	6	31
		0,g^-	0	0	1	5	−1	1	1	1	6	55
5545.4	0.8562	0,u^+	0	0	1	2	2	4	−2	1	6	59
5549.4	0.8561	2,*g*	0	0	1	5	1	1	1	1	6	40
5551.1	0.8562	2,*u*	0	0	1	2	−2	4	4	1	6	72
5552.2	0.8561	0,u^-	0	0	1	2	−2	4	2	1	6	75
		0,u^-	0	0	1	4	−2	2	2	1	6	25
5557.8	0.8562	2,*u*	0	0	1	2	2	4	0	1	6	37
5559.1	0.8499	0,g^+	0	2	0	4	0	0	0	2	4	93
5561.6	0.8499	2,*g*	0	2	0	4	2	0	0	2	4	95
5563.5	0.8561	0,u^+	0	0	1	4	0	2	0	1	6	29
5568.6	0.8561	2,*u*								1	6	<25
5570.3	0.8500	0,u^+	0	2	0	3	1	1	−1	2	4	96
5571.0	0.8562	0,g^+	0	0	1	1	1	5	−1	1	6	80
5572.2	0.8500	2,*u*	0	2	0	3	3	1	−1	2	4	83
5577.7	0.8562	2,*g*	0	0	1	1	1	5	1	1	6	29
		2,*g*	0	0	1	1	−1	5	3	1	6	55
5582.0	0.8500	0,u^-	0	2	0	3	−1	1	1	2	4	92
5582.1	0.8713	1,*u*								0	11	<25
5582.1	0.8713	1,*g*								0	11	<25
5584.7	0.8562	0,g^-	0	0	1	1	−1	5	1	1	6	56
		0,g^-	0	0	1	3	−1	3	1	1	6	36
5585.8	0.8500	2,*u*	0	2	0	3	1	1	1	2	4	77
5587.7	0.8399	1,*u*	1	0	1	1	1	0	0	2	1	100
5590.2	0.8562	2,*g*	0	0	1	1	1	5	1	1	6	37
5593.1	0.8501	0,g^+	0	2	0	2	2	2	−2	2	4	66
		0,g^+	0	2	0	2	0	2	0	2	4	31
5598.3	0.8501	0,g^-	0	2	0	2	−2	2	2	2	4	100
5598.5	0.8563	0,u^+	0	0	1	0	0	6	0	1	6	70
5602.2	0.8501	2,*g*	0	2	0	2	2	2	0	2	4	64
		2,*g*	0	2	0	2	0	2	2	2	4	33
5605.1	0.8563	2,*u*	0	0	1	0	0	6	2	1	6	73
5607.5	0.8501	0,g^+	0	2	0	2	2	2	−2	2	4	33
		0,g^+	0	2	0	2	0	2	0	2	4	57
5612.5	0.8501	2,*g*	0	2	0	2	2	2	0	2	4	31
		2,*g*	0	2	0	2	0	2	2	2	4	63
5622.8	0.8400	1,*g*	1	0	1	0	0	1	1	2	1	100
5623.7	0.8713	1,*u*								0	11	<25
5623.8	0.8713	1,*g*								0	11	<25
5626.5	0.8502	0,u^+	0	2	0	1	1	3	−1	2	4	96
5634.4	0.8502	2,*u*	0	2	0	1	1	3	1	2	4	50
		2,*u*	0	2	0	1	−1	3	3	2	4	48
5635.8	0.8502	0,u^-	0	2	0	1	−1	3	1	2	4	92
5642.1	0.8502	2,*u*	0	2	0	1	1	3	1	2	4	44
		2,*u*	0	2	0	1	−1	3	3	2	4	52
5645.2	0.8712	1,*u*	0	0	0	6	6	5	−5	0	11	63
5649.7	0.8712	1,*g*	0	0	0	5	5	6	−4	0	11	28
5661.9	0.8712	1,*u*								0	11	<25
5663.4	0.8502	0,g^+	0	2	0	0	0	4	0	2	4	94
5667.2	0.8712	1,*g*	0	0	0	5	−5	6	6	0	11	52
5670.9	0.8502	2,*g*	0	2	0	0	0	4	2	2	4	95
5678.5	0.8713	1,*g*								0	11	<25
5678.8	0.8713	1,*u*								0	11	<25
5686.0	0.8712	1,*u*								0	11	<25
5687.1	0.8712	1,*g*								0	11	<25
5695.0	0.8712	1,*g*	0	0	0	5	5	6	−4	0	11	29
		1,*g*	0	0	0	7	5	4	−4	0	11	42
5699.5	0.8712	1,*u*								0	11	<25

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
5702.9	0.8712	1,*g*								0	11	<25
5706.4	0.8465	1,*u*	0	1	1	3	1	0	0	2	3	96
5707.5	0.8712	1,*u*	0	0	0	6	−4	5	5	0	11	31
5715.7	0.8712	1,*g*	0	0	0	7	−1	4	2	0	11	25
5715.9	0.8712	1,*u*	0	0	0	6	−2	5	3	0	11	26
5717.7	0.8712	1,*g*								0	11	<25
5717.8	0.8712	1,*u*								0	11	<25
5720.9	0.8466	1,*g*	0	1	1	2	2	1	−1	2	3	70
		1,*g*	0	1	1	2	0	1	1	2	3	30
5721.8	0.8549	0,u^+	1	0	0	5	1	1	−1	1	6	82
5722.7	0.8549	0,g^+	1	0	0	4	0	2	0	1	6	40
		0,g^+	1	0	0	6	0	0	0	1	6	52
5723.2	0.8549	2,*u*	1	0	0	5	3	1	−1	1	6	70
5725.4	0.8549	2,*g*	1	0	0	4	2	2	0	1	6	36
		2,*g*	1	0	0	6	2	0	0	1	6	49
5730.7	0.8549	2,*g*	1	0	0	4	4	2	−2	1	6	82
5730.8	0.8466	1,*g*	0	1	1	2	2	1	−1	2	3	30
		1,*g*	0	1	1	2	0	1	1	2	3	67
5731.3	0.8711	1,*u*								0	11	<25
5732.3	0.8549	0,u^-	1	0	0	3	−1	3	1	1	6	35
		0,u^-	1	0	0	5	−1	1	1	1	6	61
5733.2	0.8712	1,*g*								0	11	<25
5733.4	0.8549	0,g^+	1	0	0	4	2	2	−2	1	6	71
5737.0	0.8549	2,*u*	1	0	0	3	1	3	1	1	6	26
		2,*u*	1	0	0	5	1	1	1	1	6	55
5737.1	0.8550	0,g^-	1	0	0	4	−2	2	2	1	6	85
5739.3	0.8712	1,*u*								0	11	<25
5744.5	0.8549	2,*g*	1	0	0	4	0	2	2	1	6	52
5745.0	0.8711	1,*g*	0	0	0	9	3	2	−2	0	11	43
5747.8	0.8712	1,*u*								0	11	<25
5748.2	0.8712	1,*g*	0	0	0	9	1	2	0	0	11	26
5748.9	0.8550	0,u^+	1	0	0	3	3	3	−3	1	6	79
5749.0	0.8549	0,g^+	1	0	0	4	0	2	0	1	6	29
		0,g^+	1	0	0	6	0	0	0	1	6	31
5749.1	0.8467	1,*u*	0	1	1	1	1	2	0	2	3	50
		1,*u*	0	1	1	1	−1	2	2	2	3	48
5750.5	0.8550	0,u^-	1	0	0	3	−3	3	3	1	6	97
5751.3	0.8712	1,*g*								0	11	<25
5752.0	0.8712	1,*u*								0	11	<25
5753.3	0.8550	2,*g*	1	0	0	4	0	2	2	1	6	25
5753.7	0.8712	1,*u*	0	0	0	8	−2	3	3	0	11	39
5757.2	0.8467	1,*u*	0	1	1	1	1	2	0	2	3	46
		1,*u*	0	1	1	1	−1	2	2	2	3	51
5758.8	0.8550	2,*u*	1	0	0	3	3	3	−1	1	6	58
5758.9	0.8712	1,*g*								0	11	<25
5759.5	0.8550	0,u^+	1	0	0	3	1	3	−1	1	6	55
5763.5	0.8713	1,*g*								0	11	<25
5765.4	0.8550	2,*u*	1	0	0	3	−1	3	3	1	6	68
5767.3	0.8406	1,*g*	0	3	0	1	1	0	0	3	1	100
5770.6	0.8550	0,u^-	1	0	0	3	−1	3	1	1	6	38
		0,u^-	1	0	0	5	−1	1	1	1	6	36
5775.5	0.8550	2,*u*	1	0	0	3	1	3	1	1	6	31
		2,*u*	1	0	0	5	1	1	1	1	6	25
5779.0	0.8711	1,*u*	0	0	0	10	2	1	−1	0	11	35
5779.1	0.8551	0,g^+	1	0	0	2	2	4	−2	1	6	62
		0,g^+	1	0	0	2	0	4	0	1	6	29
5781.1	0.8713	1,*u*								0	11	<25
5782.3	0.8711	1,*g*								0	11	<25
5782.8	0.8467	1,*g*	0	1	1	0	0	3	1	2	3	96
5784.7	0.8551	0,g^-	1	0	0	2	−2	4	2	1	6	85
5786.1	0.8551	2,*g*	1	0	0	2	−2	4	4	1	6	58
5790.9	0.8551	2,*g*	1	0	0	2	2	4	0	1	6	43
		2,*g*	1	0	0	2	−2	4	4	1	6	36
5791.3	0.8713	1,*u*	0	0	0	0	0	11	1	0	11	33

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
5794.3	0.8711	1,u								0	11	<25
5795.1	0.8551	0,g^+	1	0	0	2	0	4	0	1	6	31
5795.5	0.8712	1,g								0	11	<25
5800.6	0.8551	2,g	1	0	0	2	0	4	2	1	6	34
5803.1	0.8714	1,g								0	11	<25
5807.8	0.8406	1,u	0	3	0	0	0	1	1	3	1	100
5811.1	0.8552	0,u^+	1	0	0	1	1	5	−1	1	6	89
5816.9	0.8712	1,u	0	0	0	10	0	1	1	0	11	28
5818.2	0.8552	2,u	1	0	0	1	1	5	1	1	6	37
		2,u	1	0	0	1	−1	5	3	1	6	54
5821.5	0.8551	0,u^-	1	0	0	1	−1	5	1	1	6	72
		0,u^-	1	0	0	3	−1	3	1	1	6	25
5824.0	0.8710	1,g	0	0	0	11	1	0	0	0	11	64
5827.7	0.8551	2,u	1	0	0	1	1	5	1	1	6	42
		2,u	1	0	0	1	−1	5	3	1	6	33
5837.7	0.8711	1,u								0	11	<25
5837.8	0.8710	1,g	0	0	0	11	1	0	0	0	11	28
5844.1	0.8552	0,g^+	1	0	0	0	0	6	0	1	6	83
5850.9	0.8431	0,g^+	0	0	2	2	0	0	0	2	2	98
5851.2	0.8552	2,g	1	0	0	0	0	6	2	1	6	85
5853.6	0.8431	2,g	0	0	2	2	2	0	0	2	2	99
5866.9	0.8388	1,g	2	0	0	1	1	0	0	2	1	100
5868.6	0.8431	0,u^+	0	0	2	1	1	1	−1	2	2	100
5874.5	0.8617	0,u^-	0	1	0	3	−1	5	1	1	8	38
		0,u^-	0	1	0	5	−1	3	1	1	8	32
5874.5	0.8617	0,g^+	0	1	0	4	0	4	0	1	8	25
5875.8	0.8431	0,u^-	0	0	2	1	−1	1	1	2	2	100
5878.9	0.8431	2,u	0	0	2	1	1	1	1	2	2	100
5879.0	0.8617	2,u								1	8	<25
5879.1	0.8617	2,g								1	8	<25
5882.2	0.8616	2,u	0	1	0	5	5	3	−3	1	8	73
5884.3	0.8616	2,g	0	1	0	6	4	2	−2	1	8	34
5884.4	0.8617	0,u^+	0	1	0	5	1	3	−1	1	8	29
5885.1	0.8617	0,g^-	0	1	0	4	−2	4	2	1	8	42
		0,g^-	0	1	0	6	−2	2	2	1	8	34
5887.7	0.8616	0,g^+	0	1	0	6	2	2	−2	1	8	33
		0,g^+	0	1	0	6	0	2	0	1	8	27
5889.2	0.8616	2,u								1	8	<25
5891.8	0.8617	0,u^-	0	1	0	5	−3	3	3	1	8	63
5892.1	0.8616	0,u^+	0	1	0	5	3	3	−3	1	8	47
		0,u^+	0	1	0	5	1	3	−1	1	8	31
5895.7	0.8617	2,g	0	1	0	6	0	2	2	1	8	29
5898.4	0.8617	0,g^-	0	1	0	4	−4	4	4	1	8	87
5898.4	0.8617	0,g^+	0	1	0	4	4	4	−4	1	8	85
5899.0	0.8432	0,g^+	0	0	2	0	0	2	0	2	2	98
5905.7	0.8617	2,u	0	1	0	5	−1	3	3	1	8	46
5906.7	0.8432	2,g	0	0	2	0	0	2	2	2	2	99
5908.9	0.8389	1,u	2	0	0	0	0	1	1	2	1	100
5912.9	0.8616	0,u^+	0	1	0	7	1	1	−1	1	8	68
5914.0	0.8616	2,u	0	1	0	7	3	1	−1	1	8	54
5915.0	0.8617	2,g	0	1	0	4	4	4	−2	1	8	53
		2,g	0	1	0	6	4	2	−2	1	8	29
5918.1	0.8617	0,g^+								1	8	<25
5918.8	0.8617	2,g	0	1	0	4	−2	4	4	1	8	65
5921.2	0.8616	0,g^+	0	1	0	6	2	2	−2	1	8	30
		0,g^+	0	1	0	8	0	0	0	1	8	37
5923.4	0.8616	2,g	0	1	0	8	2	0	0	1	8	46
5923.4	0.8616	0,u^-	0	1	0	7	−1	1	1	1	8	55
5924.2	0.8617	0,g^-	0	1	0	2	−2	6	2	1	8	29
		0,g^-	0	1	0	6	−2	2	2	1	8	57
5928.5	0.8616	2,u	0	1	0	7	1	1	1	1	8	48
5931.8	0.8618	0,u^+	0	1	0	3	3	5	−3	1	8	55
		0,u^+	0	1	0	3	1	5	−1	1	8	26
5932.2	0.8618	2,u	0	1	0	3	−3	5	5	1	8	88

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
5932.2	0.8616	2,*g*	0	1	0	6	0	2	2	1	8	43
5932.6	0.8371	0,u^+	0	2	1	0	0	0	0	3	0	100
5932.7	0.8617	0,u^-	0	1	0	3	−3	5	3	1	8	66
		0,u^-	0	1	0	5	−3	3	3	1	8	25
5939.1	0.8454	1,*g*	1	1	0	3	1	0	0	2	3	98
5941.7	0.8616	0,g^+	0	1	0	8	0	0	0	1	8	49
5943.4	0.8617	2,*u*	0	1	0	3	3	5	−1	1	8	40
5945.0	0.8617	0,u^+	0	1	0	5	1	3	−1	1	8	30
5945.4	0.8616	2,*g*	0	1	0	8	2	0	0	1	8	40
5950.1	0.8617	2,*u*	0	1	0	5	−1	3	3	1	8	30
5959.0	0.8617	0,u^-	0	1	0	1	−1	7	1	1	8	31
		0,u^-	0	1	0	5	−1	3	1	1	8	31
		0,u^-	0	1	0	7	−1	1	1	1	8	36
5960.1	0.8455	1,*u*	1	1	0	2	2	1	−1	2	3	71
		1,*u*	1	1	0	2	0	1	1	2	3	29
5960.3	0.8618	0,g^+	0	1	0	2	2	6	−2	1	8	51
		0,g^+	0	1	0	2	0	6	0	1	8	28
5963.9	0.8617	2,*u*								1	8	<25
5965.6	0.8618	2,*g*	0	1	0	2	−2	6	4	1	8	56
5966.2	0.8618	0,g^-	0	1	0	2	−2	6	2	1	8	58
		0,g^-	0	1	0	4	−2	4	2	1	8	34
5970.4	0.8455	1,*u*	1	1	0	2	2	1	−1	2	3	29
		1,*u*	1	1	0	2	0	1	1	2	3	69
5972.9	0.8618	2,*g*	0	1	0	2	2	6	0	1	8	39
5979.0	0.8618	0,g^+	0	1	0	0	0	8	0	1	8	27
5984.5	0.8618	2,*g*	0	1	0	0	0	8	2	1	8	27
5988.1	0.8619	0,u^+	0	1	0	1	1	7	−1	1	8	75
5994.5	0.8619	2,*u*	0	1	0	1	1	7	1	1	8	30
		2,*u*	0	1	0	1	−1	7	3	1	8	48
5995.1	0.8456	1,*g*	1	1	0	1	1	2	0	2	3	53
		1,*g*	1	1	0	1	−1	2	2	2	3	46
6001.8	0.8618	0,u^-	0	1	0	1	−1	7	1	1	8	41
		0,u^-	0	1	0	3	−1	5	1	1	8	37
6003.1	0.8456	1,*g*	1	1	0	1	1	2	0	2	3	45
		1,*g*	1	1	0	1	−1	2	2	2	3	54
6007.9	0.8618	2,*u*	0	1	0	1	1	7	1	1	8	27
6014.3	0.8582	1,*g*	0	0	1	4	2	3	−1	1	7	44
6014.4	0.8582	1,*u*	0	0	1	3	1	4	0	1	7	36
		1,*u*	0	0	1	5	1	2	0	1	7	38
6015.6	0.8619	0,g^+	0	1	0	0	0	8	0	1	8	60
6016.4	0.8582	1,*u*	0	0	1	3	3	4	−2	1	7	31
		1,*u*	0	0	1	5	3	2	−2	1	7	60
6017.3	0.8582	1,*g*	0	0	1	4	0	3	1	1	7	41
6021.0	0.8582	1,*g*	0	0	1	4	4	3	−3	1	7	96
6022.3	0.8619	2,*g*	0	1	0	0	0	8	2	1	8	62
6022.6	0.8582	1,*u*	0	0	1	3	−1	4	2	1	7	36
		1,*u*	0	0	1	5	−1	2	2	1	7	45
6030.9	0.8582	1,*g*	0	0	1	4	−2	3	3	1	7	69
6035.5	0.8456	1,*u*	1	1	0	0	0	3	1	2	3	98
6042.4	0.8583	1,*u*	0	0	1	3	−3	4	4	1	7	90
6042.8	0.8581	1,*g*	0	0	1	6	2	1	−1	1	7	38
6047.7	0.8582	1,*u*	0	0	1	3	1	4	0	1	7	27
		1,*u*	0	0	1	7	1	0	0	1	7	32
6050.9	0.8581	1,*u*	0	0	1	3	3	4	−2	1	7	35
		1,*u*	0	0	1	7	1	0	0	1	7	34
6053.8	0.8735	0,u^-	0	0	0	3	−1	9	1	0	12	31
		0,u^-	0	0	0	5	−1	7	1	0	12	27
6053.8	0.8735	0,g^+								0	12	<25
6055.8	0.8582	1,*g*	0	0	1	6	0	1	1	1	7	41
6058.6	0.8582	1,*u*	0	0	1	5	−1	2	2	1	7	34
6061.6	0.8735	2,*u*								0	12	<25
6061.6	0.8735	2,*g*								0	12	<25
6070.0	0.8583	1,*g*	0	0	1	2	−2	5	3	1	7	42
6072.6	0.8582	1,*u*	0	0	1	5	1	2	0	1	7	29

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
6077.0	0.8520	1,g	0	2	0	5	1	0	0	2	5	85
6077.8	0.8583	1,g	0	0	1	2	2	5	−1	1	7	33
6079.9	0.8420	0,u^+	1	0	1	2	0	0	0	2	2	99
6081.4	0.8521	1,u	0	2	0	4	2	1	−1	2	5	63
		1,u	0	2	0	4	0	1	1	2	5	30
6082.5	0.8420	2,u	1	0	1	2	2	0	0	2	2	100
6090.3	0.8583	1,g	0	0	1	0	0	7	1	1	7	29
6094.5	0.8521	1,u	0	2	0	4	2	1	−1	2	5	27
		1,u	0	2	0	4	0	1	1	2	5	56
6095.6	0.8584	1,u	0	0	1	1	1	6	0	1	7	31
		1,u	0	0	1	1	−1	6	2	1	7	43
6097.4	0.8522	1,g	0	2	0	3	3	2	−2	2	5	76
6104.3	0.8420	0,g^+	1	0	1	1	1	1	−1	2	2	100
6105.3	0.8522	1,g	0	2	0	3	−1	2	2	2	5	58
6107.2	0.8734	0,g^-	0	0	0	4	−4	8	4	0	12	26
6107.4	0.8734	0,u^+	0	0	0	5	3	7	−3	0	12	29
6111.3	0.8583	1,u								1	7	<25
6111.5	0.8420	0,g^-	1	0	1	1	−1	1	1	2	2	100
6114.3	0.8734	2,u								0	12	<25
6114.6	0.8734	2,g								0	12	<25
6114.6	0.8420	2,g	1	0	1	1	1	1	1	2	2	100
6115.6	0.8522	1,g	0	2	0	3	1	2	0	2	5	43
		1,g	0	2	0	3	−1	2	2	2	5	28
6122.3	0.8584	1,g	0	0	1	0	0	7	1	1	7	58
6126.7	0.8522	1,u	0	2	0	2	2	3	−1	2	5	30
		1,u	0	2	0	2	0	3	1	2	5	30
		1,u	0	2	0	2	−2	3	3	2	5	35
6131.9	0.8522	1,u	0	2	0	2	2	3	−1	2	5	40
		1,u	0	2	0	2	−2	3	3	2	5	55
6138.2	0.8734	0,g^+	0	0	0	6	6	6	−6	0	12	53
6141.0	0.8733	2,u	0	0	0	7	7	5	−5	0	12	64
6141.4	0.8522	1,u	0	2	0	2	0	3	1	2	5	47
6141.4	0.8421	0,u^+	1	0	1	0	0	2	0	2	2	99
6142.1	0.8734	0,u^-	0	0	0	5	−5	7	5	0	12	47
6148.4	0.8734	2,g	0	0	0	6	6	6	−4	0	12	37
6149.4	0.8421	2,u	1	0	1	0	0	2	2	2	2	100
6153.7	0.8733	0,g^-	0	0	0	6	−6	6	6	0	12	83
6160.2	0.8523	1,g	0	2	0	1	1	4	0	2	5	45
		1,g	0	2	0	1	−1	4	2	2	5	49
6160.6	0.8734	2,u								0	12	<25
6165.1	0.8734	0,g^+								0	12	<25
6166.2	0.8734	0,u^-	0	0	0	7	−1	5	1	0	12	27
6169.6	0.8523	1,g	0	2	0	1	1	4	0	2	5	43
		1,g	0	2	0	1	−1	4	2	2	5	42
6170.5	0.8734	0,u^+	0	0	0	5	5	7	−5	0	12	38
		0,u^+	0	0	0	7	5	5	−5	0	12	33
6172.6	0.8734	2,g								0	12	<25
6173.3	0.8734	0,g^+	0	0	0	6	6	6	−6	0	12	35
6173.5	0.8734	2,u								0	12	<25
6179.0	0.8734	2,g								0	12	<25
6184.7	0.8734	2,u	0	0	0	5	−5	7	7	0	12	46
6189.7	0.8360	0,g^+	1	2	0	0	0	0	0	3	0	100
6195.6	0.8734	0,g^-	0	0	0	6	−4	6	4	0	12	30
6195.9	0.8524	1,u	0	2	0	0	0	5	1	2	5	90
6196.0	0.8733	0,u^+								0	12	<25
6197.4	0.8732	2,g	0	0	0	8	6	4	−4	0	12	59
6199.4	0.8733	0,u^-	0	0	0	7	−5	5	5	0	12	66
6202.3	0.8733	2,u								0	12	<25
6206.9	0.8734	0,g^-	0	0	0	4	−4	8	4	0	12	28
		0,g^-	0	0	0	6	−2	6	2	0	12	32
6207.3	0.8733	2,g								0	12	<25
6209.2	0.8734	0,u^-	0	0	0	5	−5	7	5	0	12	40
6211.2	0.8733	0,u^+	0	0	0	7	5	5	−5	0	12	36
6213.7	0.8733	0,g^+	0	0	0	4	4	8	−4	0	12	30

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,g^+$	0	0	0	8	4	4	−4	0	12	43
6214.9	0.8734	$2,g$								0	12	<25
6216.1	0.8734	$2,u$								0	12	<25
6217.1	0.8486	$0,u^+$	0	1	1	4	0	0	0	2	4	90
6219.8	0.8486	$2,u$	0	1	1	4	2	0	0	2	4	93
6220.2	0.8733	$2,u$								0	12	<25
6224.7	0.8487	$0,g^+$	0	1	1	3	1	1	−1	2	4	95
6225.9	0.8734	$2,g$	0	0	0	4	−4	8	6	0	12	33
6226.9	0.8487	$2,g$	0	1	1	3	3	1	−1	2	4	83
6228.6	0.8570	$1,u$	1	0	0	4	2	3	−1	1	7	28
		$1,u$	1	0	0	6	2	1	−1	1	7	49
6229.8	0.8570	$1,g$	1	0	0	5	1	2	0	1	7	48
6231.9	0.8733	$0,g^-$	0	0	0	8	−4	4	4	0	12	44
6232.7	0.8734	$0,u^-$	0	0	0	7	−3	5	3	0	12	39
6233.1	0.8571	$1,g$	1	0	0	5	3	2	−2	1	7	52
6234.9	0.8571	$1,u$	1	0	0	4	0	3	1	1	7	35
		$1,u$	1	0	0	6	0	1	1	1	7	32
6236.1	0.8487	$0,g^-$	0	1	1	3	−1	1	1	2	4	90
6239.7	0.8571	$1,u$	1	0	0	4	4	3	−3	1	7	95
6239.9	0.8487	$2,g$	0	1	1	3	1	1	1	2	4	75
6240.1	0.8733	$2,u$	0	0	0	7	−3	5	5	0	12	30
6240.7	0.8571	$1,g$	1	0	0	3	−1	4	2	1	7	27
		$1,g$	1	0	0	5	−1	2	2	1	7	63
6242.2	0.8734	$2,g$								0	12	<25
6242.5	0.8732	$0,g^+$	0	0	0	8	4	4	−4	0	12	32
		$0,g^+$	0	0	0	8	2	4	−2	0	12	30
6244.0	0.8487	$0,u^+$	0	1	1	2	2	2	−2	2	4	67
		$0,u^+$	0	1	1	2	0	2	0	2	4	29
6244.3	0.8732	$2,u$	0	0	0	9	5	3	−3	0	12	52
6244.9	0.8733	$0,u^+$	0	0	0	7	1	5	−1	0	12	50
6245.7	0.8733	$0,g^+$	0	0	0	6	2	6	−2	0	12	29
6248.7	0.8734	$0,g^+$								0	12	<25
6249.1	0.8487	$0,u^-$	0	1	1	2	−2	2	2	2	4	100
6249.3	0.8734	$0,u^-$	0	0	0	1	−1	11	1	0	12	27
6250.2	0.8733	$0,g^-$	0	0	0	6	−4	6	4	0	12	31
6251.9	0.8571	$1,u$	1	0	0	4	−2	3	3	1	7	71
6253.2	0.8487	$2,u$	0	1	1	2	2	2	0	2	4	59
		$2,u$	0	1	1	2	0	2	2	2	4	37
6254.8	0.8734	$2,g$	0	0	0	8	2	4	0	0	12	26
6255.0	0.8733	$2,u$								0	12	<25
6255.1	0.8570	$1,g$	1	0	0	7	1	0	0	1	7	70
6255.7	0.8733	$0,u^+$	0	0	0	5	3	7	−3	0	12	33
		$0,u^+$	0	0	0	9	3	3	−3	0	12	40
6256.2	0.8733	$2,g$								0	12	<25
6256.5	0.8733	$2,u$	0	0	0	7	1	5	1	0	12	36
6258.2	0.8487	$0,u^+$	0	1	1	2	2	2	−2	2	4	32
		$0,u^+$	0	1	1	2	0	2	0	2	4	54
6258.4	0.8571	$1,u$	1	0	0	4	2	3	−1	1	7	28
6261.2	0.8733	$2,g$								0	12	<25
6263.1	0.8487	$2,u$	0	1	1	2	2	2	0	2	4	33
		$2,u$	0	1	1	2	0	2	2	2	4	58
6264.4	0.8733	$0,g^+$	0	0	0	8	0	4	0	0	12	27
6264.5	0.8734	$2,u$	0	0	0	5	−3	7	5	0	12	33
6264.5	0.8732	$0,u^+$	0	0	0	9	1	3	−1	0	12	45
6264.6	0.8733	$0,u^-$	0	0	0	9	−3	3	3	0	12	48
6265.2	0.8733	$0,g^-$	0	0	0	2	−2	10	2	0	12	32
		$0,g^-$	0	0	0	8	−2	4	2	0	12	41
6266.2	0.8733	$0,u^+$	0	0	0	5	1	7	−1	0	12	29
6268.1	0.8572	$1,g$	1	0	0	3	−3	4	4	1	7	90
6269.7	0.8733	$2,u$	0	0	0	9	3	3	−1	0	12	27
6269.8	0.8732	$2,g$								0	12	<25
6271.3	0.8571	$1,u$	1	0	0	6	0	1	1	1	7	38
6271.5	0.8426	$0,g^+$	0	3	0	2	0	0	0	3	2	99
6272.2	0.8571	$1,g$	1	0	0	3	3	4	−2	1	7	63

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
6273.7	0.8733	$2,g$								0	12	<25
6273.7	0.8488	$0,g^+$	0	1	1	1	1	3	−1	2	4	95
6273.9	0.8426	$2,g$	0	3	0	2	2	0	0	3	2	100
6276.8	0.8733	$2,u$								0	12	<25
6277.3	0.8734	$0,g^+$								0	12	<25
6281.2	0.8571	$1,g$	1	0	0	3	−1	4	2	1	7	33
6281.5	0.8488	$2,g$	0	1	1	1	1	3	1	2	4	45
		$2,g$	0	1	1	1	−1	3	3	2	4	52
6282.6	0.8733	$2,g$								0	12	<25
6283.4	0.8488	$0,g^-$	0	1	1	1	−1	3	1	2	4	90
6284.6	0.8733	$0,u^-$								0	12	<25
6288.3	0.8732	$2,g$	0	0	0	10	4	2	−2	0	12	28
6289.2	0.8731	$0,g^+$	0	0	0	10	2	2	−2	0	12	47
		$0,g^+$	0	0	0	10	0	2	0	0	12	36
6289.3	0.8488	$2,g$	0	1	1	1	1	3	1	2	4	46
		$2,g$	0	1	1	1	−1	3	3	2	4	48
6289.5	0.8735	$0,u^+$	0	0	0	3	1	9	−1	0	12	33
6291.6	0.8733	$2,u$								0	12	<25
6292.3	0.8571	$1,g$	1	0	0	5	1	2	0	1	7	30
6297.9	0.8735	$2,u$								0	12	<25
6300.7	0.8572	$1,u$	1	0	0	2	0	5	1	1	7	27
		$1,u$	1	0	0	2	−2	5	3	1	7	44
6301.2	0.8427	$0,u^+$	0	3	0	1	1	1	−1	3	2	100
6302.6	0.8733	$0,g^-$	0	0	0	10	−2	2	2	0	12	44
6303.0	0.8733	$0,u^+$								0	12	<25
6303.0	0.8735	$0,g^+$	0	0	0	0	0	12	0	0	12	44
6305.5	0.8734	$2,g$								0	12	<25
6305.9	0.8572	$1,u$	1	0	0	2	2	5	−1	1	7	43
		$1,u$	1	0	0	2	−2	5	3	1	7	30
6306.9	0.8489	$0,u^+$	0	1	1	0	0	4	0	2	4	92
6307.1	0.8733	$0,u^-$	0	0	0	9	−1	3	1	0	12	33
6307.2	0.8735	$0,g^+$	0	0	0	2	2	10	−2	0	12	36
6308.1	0.8733	$2,u$								0	12	<25
6308.3	0.8427	$0,u^-$	0	3	0	1	−1	1	1	3	2	100
6311.4	0.8427	$2,u$	0	3	0	1	1	1	1	3	2	100
6311.7	0.8734	$2,g$								0	12	<25
6314.1	0.8733	$2,u$								0	12	<25
6314.3	0.8489	$2,u$	0	1	1	0	0	4	2	2	4	94
6314.3	0.8735	$2,g$	0	0	0	2	2	10	0	0	12	27
6316.7	0.8572	$1,u$	1	0	0	4	0	3	1	1	7	25
6323.0	0.8732	$0,g^-$	0	0	0	10	−2	2	2	0	12	40
6324.3	0.8733	$0,u^+$	0	0	0	1	1	11	−1	0	12	26
		$0,u^+$	0	0	0	11	1	1	−1	0	12	44
6326.8	0.8731	$2,u$	0	0	0	11	3	1	−1	0	12	46
6328.9	0.8732	$2,g$								0	12	<25
6330.1	0.8732	$0,u^+$	0	0	0	11	1	1	−1	0	12	43
6332.2	0.8573	$1,g$	1	0	0	1	1	6	0	1	7	38
		$1,g$	1	0	0	1	−1	6	2	1	7	47
6335.3	0.8734	$2,u$								0	12	<25
6335.8	0.8734	$0,g^+$								0	12	<25
6342.2	0.8734	$2,g$								0	12	<25
6342.7	0.8573	$1,g$	1	0	0	1	1	6	0	1	7	33
		$1,g$	1	0	0	1	−1	6	2	1	7	27
6343.5	0.8428	$0,g^+$	0	3	0	0	0	2	0	3	2	99
6347.6	0.8732	$0,u^-$	0	0	0	11	−1	1	1	0	12	33
6349.6	0.8409	$0,g^+$	2	0	0	2	0	0	0	2	2	99
6351.6	0.8428	$2,g$	0	3	0	0	0	2	2	3	2	100
6352.0	0.8409	$2,g$	2	0	0	2	2	0	0	2	2	100
6353.5	0.8732	$2,u$	0	0	0	11	1	1	1	0	12	28
6356.9	0.8452	$1,g$	0	0	2	3	1	0	0	2	3	94
6363.0	0.8732	$0,g^+$								0	12	<25
6363.5	0.8574	$1,u$	1	0	0	0	0	7	1	1	7	77
6367.7	0.8452	$1,u$	0	0	2	2	2	1	−1	2	3	69
		$1,u$	0	0	2	2	0	1	1	2	3	30

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
6368.5	0.8732	2,*g*								0	12	<25
6372.4	0.8639	1,*g*								1	9	<25
6372.4	0.8639	1,*u*								1	9	<25
6373.7	0.8730	0,u^-	0	0	0	11	−1	1	1	0	12	57
6377.4	0.8452	1,*u*	0	0	2	2	2	1	−1	2	3	30
		1,*u*	0	0	2	2	0	1	1	2	3	65
6378.4	0.8731	2,*u*	0	0	0	11	1	1	1	0	12	36
6380.8	0.8410	0,u^+	2	0	0	1	1	1	−1	2	2	100
6381.0	0.8729	0,g^+	0	0	0	12	0	0	0	0	12	80
6383.7	0.8729	2,*g*	0	0	0	12	2	0	0	0	12	72
6388.0	0.8410	0,u^-	2	0	0	1	−1	1	1	2	2	100
6389.8	0.8638	1,*g*	0	1	0	5	5	4	−4	1	9	41
6390.4	0.8638	1,*u*	0	1	0	4	4	5	−3	1	9	26
		1,*u*	0	1	0	6	4	3	−3	1	9	26
6391.1	0.8410	2,*u*	2	0	0	1	1	1	1	2	2	100
6392.2	0.8453	1,*g*	0	0	2	1	1	2	0	2	3	47
		1,*g*	0	0	2	1	−1	2	2	2	3	50
6397.5	0.8638	1,*g*	0	1	0	5	5	4	−4	1	9	51
6400.3	0.8453	1,*g*	0	0	2	1	1	2	0	2	3	48
		1,*g*	0	0	2	1	−1	2	2	2	3	49
6401.2	0.8638	1,*u*	0	1	0	6	4	3	−3	1	9	26
6406.2	0.8638	1,*g*								1	9	<25
6410.9	0.8638	1,*u*	0	1	0	4	−4	5	5	1	9	26
6419.4	0.8638	1,*g*	0	1	0	5	−3	4	4	1	9	39
6422.2	0.8454	1,*u*	0	0	2	0	0	3	1	2	3	95
6424.0	0.8638	1,*u*	0	1	0	4	−4	5	5	1	9	63
6424.7	0.8410	0,g^+	2	0	0	0	0	2	0	2	2	99
6431.2	0.8637	1,*g*	0	1	0	7	3	2	−2	1	9	48
6431.4	0.8637	1,*u*	0	1	0	4	4	5	−3	1	9	34
		1,*u*	0	1	0	6	4	3	−3	1	9	29
6432.0	0.8392	1,*u*	0	2	1	1	1	0	0	3	1	100
6432.8	0.8410	2,*g*	2	0	0	0	0	2	2	2	2	100
6435.6	0.8638	1,*u*								1	9	<25
6435.6	0.8638	1,*g*	0	1	0	7	1	2	0	1	9	38
6437.0	0.8638	1,*u*	0	1	0	8	0	1	1	1	9	35
6439.6	0.8638	1,*g*	0	1	0	7	−1	2	2	1	9	53
6440.8	0.8475	0,g^+	1	1	0	4	0	0	0	2	4	94
6443.3	0.8475	2,*g*	1	1	0	4	2	0	0	2	4	96
6448.6	0.8638	1,*u*	0	1	0	6	−2	3	3	1	9	29
6454.9	0.8476	0,u^+	1	1	0	3	1	1	−1	2	4	97
6456.6	0.8476	2,*u*	1	1	0	3	3	1	−1	2	4	83
6456.9	0.8637	1,*u*								1	9	<25
6459.5	0.8639	1,*g*	0	1	0	3	−3	6	4	1	9	55
6465.4	0.8639	1,*g*	0	1	0	3	3	6	−2	1	9	42
6466.8	0.8476	0,u^-	1	1	0	3	−1	1	1	2	4	93
6468.0	0.8636	1,*g*	0	1	0	9	1	0	0	1	9	73
6468.5	0.8393	1,*g*	0	2	1	0	0	1	1	3	1	100
6470.5	0.8476	2,*u*	1	1	0	3	1	1	1	2	4	78
6475.1	0.8637	1,*u*	0	1	0	8	0	1	1	1	9	38
6476.0	0.8638	1,*g*								1	9	<25
6480.4	0.8476	0,g^+	1	1	0	2	2	2	−2	2	4	65
		0,g^+	1	1	0	2	0	2	0	2	4	32
6485.6	0.8476	0,g^-	1	1	0	2	−2	2	2	2	4	100
6489.4	0.8476	2,*g*	1	1	0	2	2	2	0	2	4	66
		2,*g*	1	1	0	2	0	2	2	2	4	32
6490.5	0.8640	1,*u*	0	1	0	2	0	7	1	1	9	26
		1,*u*	0	1	0	2	−2	7	3	1	9	38
6491.9	0.8638	1,*g*	0	1	0	7	1	2	0	1	9	25
6494.9	0.8476	0,g^+	1	1	0	2	2	2	−2	2	4	34
		0,g^+	1	1	0	2	0	2	0	2	4	58
6496.3	0.8639	1,*u*	0	1	0	2	2	7	−1	1	9	33
6499.9	0.8476	2,*g*	1	1	0	2	2	2	0	2	4	30
		2,*g*	1	1	0	2	0	2	2	2	4	65
6510.1	0.8639	1,*u*	0	1	0	0	0	9	1	1	9	31

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
6510.5	0.8604	$0,u^+$								1	8	<25
6510.6	0.8604	$0,g^-$	0	0	1	3	−1	5	1	1	8	43
		$0,g^-$	0	0	1	5	−1	3	1	1	8	27
6516.5	0.8604	$2,u$	0	0	1	4	2	4	0	1	8	25
6516.5	0.8604	$2,g$								1	8	<25
6516.6	0.8477	$0,u^+$	1	1	0	1	1	3	−1	2	4	97
6517.3	0.8640	$1,g$	0	1	0	1	1	8	0	1	9	32
		$1,g$	0	1	0	1	−1	8	2	1	9	38
6521.5	0.8756	$1,u$								0	13	<25
6521.5	0.8756	$1,g$								0	13	<25
6523.0	0.8603	$2,g$	0	0	1	5	5	3	−3	1	8	89
6523.4	0.8603	$0,g^+$	0	0	1	3	3	5	−3	1	8	27
		$0,g^+$	0	0	1	5	3	3	−3	1	8	25
6523.6	0.8603	$0,u^-$	0	0	1	4	−2	4	2	1	8	44
6524.6	0.8477	$2,u$	1	1	0	1	1	3	1	2	4	52
		$2,u$	1	1	0	1	−1	3	3	2	4	46
6525.2	0.8603	$2,u$	0	0	1	4	4	4	−2	1	8	35
		$2,u$	0	0	1	6	4	2	−2	1	8	36
6525.8	0.8477	$0,u^-$	1	1	0	1	−1	3	1	2	4	93
6528.9	0.8603	$0,u^+$								1	8	<25
6529.4	0.8603	$2,g$	0	0	1	5	3	3	−1	1	8	33
6530.8	0.8603	$0,g^-$	0	0	1	3	−3	5	3	1	8	31
		$0,g^-$	0	0	1	5	−3	3	3	1	8	56
6532.1	0.8639	$1,g$								1	9	<25
6532.2	0.8477	$2,u$	1	1	0	1	1	3	1	2	4	43
		$2,u$	1	1	0	1	−1	3	3	2	4	54
6532.4	0.8603	$0,g^+$	0	0	1	5	3	3	−3	1	8	35
		$0,g^+$	0	0	1	5	1	3	−1	1	8	39
6535.2	0.8603	$2,u$								1	8	<25
6536.0	0.8604	$0,u^-$	0	0	1	4	−4	4	4	1	8	85
6536.3	0.8603	$0,u^+$	0	0	1	4	4	4	−4	1	8	74
6543.5	0.8641	$1,u$	0	1	0	0	0	9	1	1	9	50
6543.8	0.8603	$2,g$	0	0	1	5	−1	3	3	1	8	36
6554.8	0.8604	$2,u$	0	0	1	4	−2	4	4	1	8	51
6555.4	0.8603	$2,u$	0	0	1	4	4	4	−2	1	8	39
		$2,u$	0	0	1	6	4	2	−2	1	8	34
6556.5	0.8478	$0,g^+$	1	1	0	0	0	4	0	2	4	95
6557.3	0.8602	$0,g^+$	0	0	1	7	1	1	−1	1	8	68
6557.6	0.8603	$0,u^+$								1	8	<25
6558.8	0.8602	$2,g$	0	0	1	7	3	1	−1	1	8	57
6563.7	0.8603	$0,u^+$	0	0	1	6	2	2	−2	1	8	28
6563.9	0.8603	$0,u^-$	0	0	1	2	−2	6	2	1	8	34
		$0,u^-$	0	0	1	6	−2	2	2	1	8	62
6564.0	0.8478	$2,g$	1	1	0	0	0	4	2	2	4	96
6564.1	0.8603	$0,g^-$	0	0	1	1	−1	7	1	1	8	27
		$0,g^-$	0	0	1	7	−1	1	1	1	8	40
6565.8	0.8604	$2,g$	0	0	1	3	−3	5	5	1	8	84
6566.4	0.8603	$2,u$	0	0	1	2	2	6	0	1	8	27
		$2,u$	0	0	1	6	2	2	0	1	8	33
6566.9	0.8604	$0,g^+$	0	0	1	3	3	5	−3	1	8	49
		$0,g^+$	0	0	1	3	1	5	−1	1	8	25
6568.7	0.8604	$0,g^-$	0	0	1	3	−3	5	3	1	8	59
		$0,g^-$	0	0	1	5	−3	3	3	1	8	35
6569.9	0.8603	$2,g$	0	0	1	7	1	1	1	1	8	39
6572.7	0.8603	$2,u$	0	0	1	6	0	2	2	1	8	55
6576.7	0.8441	$1,u$	1	0	1	3	1	0	0	2	3	97
6579.5	0.8604	$2,g$	0	0	1	3	3	5	−1	1	8	26
6582.3	0.8603	$0,g^+$	0	0	1	5	1	3	−1	1	8	31
6586.1	0.8358	$0,g^+$	0	1	2	0	0	0	0	3	0	99
6586.5	0.8604	$2,g$	0	0	1	5	−1	3	3	1	8	30
6587.5	0.8755	$1,g$								0	13	<25
6587.5	0.8756	$1,u$								0	13	<25
6587.7	0.8602	$0,u^+$	0	0	1	8	0	0	0	1	8	70
6590.9	0.8602	$2,u$	0	0	1	8	2	0	0	1	8	69

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
6591.7	0.8605	$0,u^+$	0	0	1	2	2	6	−2	1	8	49
6594.0	0.8441	$1,g$	1	0	1	2	2	1	−1	2	3	70
		$1,g$	1	0	1	2	0	1	1	2	3	29
6594.8	0.8542	$0,u^+$	0	2	0	5	1	1	−1	2	6	84
6595.2	0.8542	$0,g^+$	0	2	0	4	0	2	0	2	6	34
		$0,g^+$	0	2	0	6	0	0	0	2	6	60
6596.1	0.8542	$2,u$	0	2	0	5	3	1	−1	2	6	72
6596.4	0.8605	$2,u$	0	0	1	2	−2	6	4	1	8	50
6597.9	0.8542	$2,g$	0	2	0	4	2	2	0	2	6	31
		$2,g$	0	2	0	6	2	0	0	2	6	60
6598.8	0.8603	$0,g^-$	0	0	1	1	−1	7	1	1	8	30
		$0,g^-$	0	0	1	7	−1	1	1	1	8	50
6600.2	0.8604	$0,u^-$	0	0	1	2	−2	6	2	1	8	46
		$0,u^-$	0	0	1	4	−2	4	2	1	8	39
6603.5	0.8603	$2,g$	0	0	1	7	1	1	1	1	8	34
6604.1	0.8441	$1,g$	1	0	1	2	2	1	−1	2	3	29
		$1,g$	1	0	1	2	0	1	1	2	3	68
6604.3	0.8542	$2,g$	0	2	0	4	4	2	−2	2	6	87
6606.1	0.8542	$0,u^-$	0	2	0	3	−1	3	1	2	6	31
		$0,u^-$	0	2	0	5	−1	1	1	2	6	65
6606.4	0.8604	$2,u$	0	0	1	2	2	6	0	1	8	30
6607.2	0.8542	$0,g^+$	0	2	0	4	2	2	−2	2	6	70
6610.6	0.8542	$2,u$	0	2	0	5	1	1	1	2	6	57
6611.5	0.8543	$0,g^-$	0	2	0	4	−2	2	2	2	6	86
6614.2	0.8604	$0,u^+$	0	0	1	0	0	8	0	1	8	35
6616.4	0.8605	$0,g^+$	0	0	1	1	1	7	−1	1	8	65
6618.5	0.8543	$2,g$	0	2	0	4	0	2	2	2	6	49
6619.4	0.8604	$2,u$	0	0	1	0	0	8	2	1	8	34
6622.5	0.8605	$2,g$	0	0	1	1	1	7	1	1	8	26
		$2,g$	0	0	1	1	−1	7	3	1	8	43
6623.1	0.8543	$0,g^+$	0	2	0	4	0	2	0	2	6	33
		$0,g^+$	0	2	0	6	0	0	0	2	6	25
6624.3	0.8543	$0,u^+$	0	2	0	3	3	3	−3	2	6	78
6625.1	0.8442	$1,u$	1	0	1	1	1	2	0	2	3	51
		$1,u$	1	0	1	1	−1	2	2	2	3	47
6625.9	0.8543	$0,u^-$	0	2	0	3	−3	3	3	2	6	96
6627.0	0.8755	$1,g$	0	0	0	7	7	6	−6	0	13	38
6627.6	0.8543	$2,g$	0	2	0	4	0	2	2	2	6	31
6629.1	0.8755	$1,u$								0	13	<25
6633.1	0.8442	$1,u$	1	0	1	1	1	2	0	2	3	46
		$1,u$	1	0	1	1	−1	2	2	2	3	53
6633.9	0.8543	$2,u$	0	2	0	3	3	3	−1	2	6	60
6634.8	0.8543	$0,u^+$	0	2	0	3	1	3	−1	2	6	56
6634.9	0.8604	$0,g^-$	0	0	1	1	−1	7	1	1	8	29
		$0,g^-$	0	0	1	3	−1	5	1	1	8	37
6640.5	0.8604	$2,g$								1	8	<25
6641.0	0.8543	$2,u$	0	2	0	3	−1	3	3	2	6	68
6642.8	0.8605	$0,u^+$	0	0	1	0	0	8	0	1	8	43
		$0,u^+$	0	0	1	2	0	6	0	1	8	26
6645.7	0.8543	$0,u^-$	0	2	0	3	−1	3	1	2	6	42
		$0,u^-$	0	2	0	5	−1	1	1	2	6	33
6647.1	0.8755	$1,g$	0	0	0	7	7	6	−6	0	13	31
6649.0	0.8605	$2,u$	0	0	1	0	0	8	2	1	8	46
6650.3	0.8756	$1,u$								0	13	<25
6650.7	0.8543	$2,u$	0	2	0	3	1	3	1	2	6	34
6653.8	0.8755	$1,g$								0	13	<25
6655.7	0.8544	$0,g^+$	0	2	0	2	2	4	−2	2	6	62
		$0,g^+$	0	2	0	2	0	4	0	2	6	29
6656.9	0.8755	$1,u$	0	0	0	6	−6	7	7	0	13	49
6661.2	0.8544	$0,g^-$	0	2	0	2	−2	4	2	2	6	86
6661.7	0.8443	$1,g$	1	0	1	0	0	3	1	2	3	97
6662.9	0.8544	$2,g$	0	2	0	2	0	4	2	2	6	25
		$2,g$	0	2	0	2	−2	4	4	2	6	55
6667.5	0.8544	$2,g$	0	2	0	2	2	4	0	2	6	44

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		2,*g*	0	2	0	2	−2	4	4	2	6	38
6671.4	0.8544	0,g^+	0	2	0	2	0	4	0	2	6	34
6677.0	0.8544	2,*g*	0	2	0	2	0	4	2	2	6	37
6679.4	0.8381	1,*g*	1	2	0	1	1	0	0	3	1	100
6682.3	0.8755	1,*g*								0	13	<25
6684.8	0.8755	1,*u*								0	13	<25
6689.1	0.8545	0,u^+	0	2	0	1	1	5	−1	2	6	90
6692.3	0.8755	1,*u*								0	13	<25
6694.2	0.8755	1,*g*								0	13	<25
6696.3	0.8545	2,*u*	0	2	0	1	1	5	1	2	6	38
		2,*u*	0	2	0	1	−1	5	3	2	6	53
6699.0	0.8544	0,u^-	0	2	0	1	−1	5	1	2	6	74
6702.6	0.8754	1,*u*	0	0	0	8	6	5	−5	0	13	49
6705.3	0.8545	2,*u*	0	2	0	1	1	5	1	2	6	42
		2,*u*	0	2	0	1	−1	5	3	2	6	34
6709.0	0.8755	1,*g*	0	0	0	7	−5	6	6	0	13	36
6722.9	0.8382	1,*u*	1	2	0	0	0	1	1	3	1	100
6723.4	0.8545	0,g^+	0	2	0	0	0	6	0	2	6	85
6724.1	0.8755	1,*u*								0	13	<25
6725.0	0.8755	1,*g*								0	13	<25
6728.1	0.8592	0,g^+	1	0	0	4	0	4	0	1	8	26
6728.2	0.8592	0,u^-	1	0	0	3	−1	5	1	1	8	34
		0,u^-	1	0	0	5	−1	3	1	1	8	36
6730.5	0.8545	2,*g*	0	2	0	0	0	6	2	2	6	86
6730.9	0.8592	2,*u*	1	0	0	5	5	3	−3	1	8	51
6730.9	0.8592	2,*g*	1	0	0	4	4	4	−2	1	8	30
		2,*g*	1	0	0	6	4	2	−2	1	8	48
6731.3	0.8507	1,*u*	0	1	1	5	1	0	0	2	5	75
6732.7	0.8508	1,*g*	0	1	1	4	2	1	−1	2	5	61
		1,*g*	0	1	1	4	0	1	1	2	5	29
6732.9	0.8755	1,*u*								0	13	<25
6733.3	0.8592	2,*u*	1	0	0	5	5	3	−3	1	8	46
		2,*u*	1	0	0	5	3	3	−1	1	8	29
6733.5	0.8755	1,*g*								0	13	<25
6734.9	0.8592	2,*g*	1	0	0	6	2	2	0	1	8	36
6735.1	0.8592	0,u^+	1	0	0	5	1	3	−1	1	8	34
		0,u^+	1	0	0	7	1	1	−1	1	8	32
6736.9	0.8592	0,g^-	1	0	0	4	−2	4	2	1	8	39
		0,g^-	1	0	0	6	−2	2	2	1	8	44
6737.3	0.8591	0,g^+	1	0	0	6	2	2	−2	1	8	40
		0,g^+	1	0	0	6	0	2	0	1	8	30
6739.7	0.8592	2,*u*	1	0	0	5	1	3	1	1	8	30
6743.2	0.8592	0,u^+	1	0	0	5	3	3	−3	1	8	60
6743.7	0.8592	0,u^-	1	0	0	5	−3	3	3	1	8	68
6744.8	0.8755	1,*g*								0	13	<25
6744.9	0.8508	1,*g*	0	1	1	4	2	1	−1	2	5	25
		1,*g*	0	1	1	4	0	1	1	2	5	52
6745.9	0.8508	1,*u*	0	1	1	3	3	2	−2	2	5	78
6746.0	0.8755	1,*u*								0	13	<25
6747.0	0.8592	2,*g*	1	0	0	4	0	4	2	1	8	26
		2,*g*	1	0	0	6	0	2	2	1	8	38
6749.7	0.8753	1,*g*	0	0	0	9	5	4	−4	0	13	63
6751.5	0.8754	1,*u*	0	0	0	8	−4	5	5	0	13	32
6751.8	0.8593	0,g^+	1	0	0	4	4	4	−4	1	8	89
6751.8	0.8593	0,g^-	1	0	0	4	−4	4	4	1	8	89
6753.1	0.8508	1,*u*	0	1	1	3	−1	2	2	2	5	61
6758.0	0.8755	1,*g*								0	13	<25
6758.2	0.8592	2,*u*	1	0	0	5	−1	3	3	1	8	52
6761.2	0.8591	0,u^+	1	0	0	7	1	1	−1	1	8	59
6762.2	0.8591	2,*u*	1	0	0	7	3	1	−1	1	8	46
6763.2	0.8508	1,*u*	0	1	1	3	1	2	0	2	5	40
6763.3	0.8755	1,*u*								0	13	<25
6766.8	0.8592	2,*g*	1	0	0	4	4	4	−2	1	8	60
		2,*g*	1	0	0	6	4	2	−2	1	8	25

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
6766.9	0.8591	$0,g^+$	1	0	0	8	0	0	0	1	8	65
6767.3	0.8755	$1,u$								0	13	<25
6769.3	0.8754	$1,g$								0	13	<25
6769.8	0.8590	$2,g$	1	0	0	8	2	0	0	1	8	69
6771.1	0.8509	$1,g$	0	1	1	2	2	3	−1	2	5	27
		$1,g$	0	1	1	2	0	3	1	2	5	27
		$1,g$	0	1	1	2	−2	3	3	2	5	40
6771.4	0.8592	$0,g^+$	1	0	0	4	2	4	−2	1	8	32
		$0,g^+$	1	0	0	6	2	2	−2	1	8	26
6773.1	0.8593	$2,g$	1	0	0	4	−2	4	4	1	8	70
6773.2	0.8592	$0,u^-$	1	0	0	7	−1	1	1	1	8	63
6776.1	0.8592	$0,g^-$	1	0	0	2	−2	6	2	1	8	26
		$0,g^-$	1	0	0	6	−2	2	2	1	8	50
6776.4	0.8509	$1,g$	0	1	1	2	2	3	−1	2	5	41
		$1,g$	0	1	1	2	−2	3	3	2	5	51
6778.0	0.8591	$2,u$	1	0	0	7	1	1	1	1	8	52
6780.3	0.8447	$1,g$	0	3	0	3	1	0	0	3	3	98
6780.5	0.8754	$1,u$	0	0	0	8	−2	5	3	0	13	26
6781.2	0.8754	$1,g$								0	13	<25
6783.5	0.8592	$2,g$	1	0	0	6	0	2	2	1	8	29
6785.1	0.8754	$1,g$								0	13	<25
6785.3	0.8754	$1,u$	0	0	0	8	2	5	−1	0	13	29
6786.2	0.8509	$1,g$	0	1	1	2	0	3	1	2	5	41
6787.3	0.8593	$0,u^+$	1	0	0	3	3	5	−3	1	8	61
6787.8	0.8593	$0,u^-$	1	0	0	3	−3	5	3	1	8	70
6788.6	0.8593	$2,u$	1	0	0	3	−3	5	5	1	8	90
6789.1	0.8753	$1,g$	0	0	0	9	1	4	0	0	13	26
		$1,g$	0	0	0	9	−1	4	2	0	13	25
6790.1	0.8754	$1,u$								0	13	<25
6790.7	0.8592	$0,g^+$	1	0	0	6	0	2	0	1	8	29
		$0,g^+$	1	0	0	8	0	0	0	1	8	27
6795.1	0.8592	$2,g$	1	0	0	6	2	2	0	1	8	25
6797.1	0.8753	$1,u$								0	13	<25
6798.3	0.8593	$2,u$	1	0	0	3	3	5	−1	1	8	49
6799.4	0.8593	$0,u^+$	1	0	0	3	1	5	−1	1	8	35
		$0,u^+$	1	0	0	5	1	3	−1	1	8	27
6799.5	0.8755	$1,g$								0	13	<25
6801.0	0.8510	$1,u$	0	1	1	1	1	4	0	2	5	42
		$1,u$	0	1	1	1	−1	4	2	2	5	50
6802.7	0.8448	$1,u$	0	3	0	2	2	1	−1	3	3	71
		$1,u$	0	3	0	2	0	1	1	3	3	29
6805.0	0.8593	$2,u$	1	0	0	3	−1	5	3	1	8	32
		$2,u$	1	0	0	5	−1	3	3	1	8	26
6808.5	0.8756	$1,u$								0	13	<25
6809.2	0.8755	$1,g$								0	13	<25
6811.2	0.8509	$1,u$	0	1	1	1	1	4	0	2	5	42
		$1,u$	0	1	1	1	−1	4	2	2	5	39
6811.5	0.8592	$0,u^-$	1	0	0	1	−1	7	1	1	8	31
		$0,u^-$	1	0	0	5	−1	3	1	1	8	38
6813.0	0.8448	$1,u$	0	3	0	2	2	1	−1	3	3	29
		$1,u$	0	3	0	2	0	1	1	3	3	69
6814.6	0.8754	$1,u$	0	0	0	10	0	3	1	0	13	39
6815.4	0.8755	$1,u$								0	13	<25
6815.8	0.8755	$1,g$								0	13	<25
6816.7	0.8592	$2,u$	1	0	0	5	1	3	1	1	8	28
6818.9	0.8594	$0,g^+$	1	0	0	2	2	6	−2	1	8	54
		$0,g^+$	1	0	0	2	0	6	0	1	8	29
6820.0	0.8755	$1,g$								0	13	<25
6822.2	0.8755	$1,u$								0	13	<25
6823.1	0.8593	$0,g^-$	1	0	0	2	−2	6	2	1	8	65
		$0,g^-$	1	0	0	4	−2	4	2	1	8	29
6824.1	0.8756	$1,g$								0	13	<25
6824.3	0.8594	$2,g$	1	0	0	2	−2	6	4	1	8	61
6828.3	0.8347	$0,u^+$	1	1	1	0	0	0	0	3	0	99

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
6830.1	0.8594	2,g	1	0	0	2	2	6	0	1	8	46
6830.3	0.8751	1,g	0	0	0	11	3	2	−2	0	13	35
		1,g	0	0	0	11	1	2	0	0	13	32
6833.1	0.8510	1,g	0	1	1	0	0	5	1	2	5	87
6834.7	0.8593	0,g^+	1	0	0	4	0	4	0	1	8	25
6835.2	0.8757	1,u								0	13	<25
6837.0	0.8430	1,g	2	0	0	3	1	0	0	2	3	98
6839.1	0.8449	1,g	0	3	0	1	1	2	0	3	3	54
		1,g	0	3	0	1	−1	2	2	3	3	46
6840.5	0.8593	2,g								1	8	<25
6847.1	0.8449	1,g	0	3	0	1	1	2	0	3	3	44
		1,g	0	3	0	1	−1	2	2	3	3	54
6848.0	0.8754	1,u								0	13	<25
6849.1	0.8595	0,u^+	1	0	0	1	1	7	−1	1	8	80
6850.7	0.8756	1,g								0	13	<25
6853.8	0.8756	1,u	0	0	0	2	0	11	1	0	13	27
6855.7	0.8595	2,u	1	0	0	1	1	7	1	1	8	31
		2,u	1	0	0	1	−1	7	3	1	8	51
6859.9	0.8594	0,u^-	1	0	0	1	−1	7	1	1	8	49
		0,u^-	1	0	0	3	−1	5	1	1	8	35
6859.9	0.8660	0,u^-	0	1	0	3	−1	7	1	1	10	33
		0,u^-	0	1	0	5	−1	5	1	1	10	28
6859.9	0.8660	0,g^+	0	1	0	4	2	6	−2	1	10	25
6860.9	0.8752	1,g	0	0	0	11	3	2	−2	0	13	25
6860.9	0.8430	1,u	2	0	0	2	2	1	−1	2	3	71
		1,u	2	0	0	2	0	1	1	2	3	28
6864.0	0.8472	0,g^+	0	0	2	4	0	0	0	2	4	83
6865.3	0.8754	1,g								0	13	<25
6866.3	0.8594	2,u	1	0	0	1	1	7	1	1	8	32
6866.8	0.8660	2,g								1	10	<25
6866.8	0.8660	2,u								1	10	<25
6867.1	0.8472	2,g	0	0	2	4	2	0	0	2	4	88
6868.3	0.8473	0,u^+	0	0	2	3	1	1	−1	2	4	93
6871.0	0.8473	2,u	0	0	2	3	3	1	−1	2	4	82
6871.3	0.8430	1,u	2	0	0	2	2	1	−1	2	3	29
		1,u	2	0	0	2	0	1	1	2	3	70
6875.0	0.8750	1,u	0	0	0	12	2	1	−1	0	13	58
		1,u	0	0	0	12	0	1	1	0	13	33
6878.4	0.8595	0,g^+	1	0	0	0	0	8	0	1	8	69
6879.2	0.8473	0,u^-	0	0	2	3	−1	1	1	2	4	86
6881.0	0.8450	1,u	0	3	0	0	0	3	1	3	3	98
6883.2	0.8473	2,u	0	0	2	3	1	1	1	2	4	71
6884.6	0.8474	0,g^+	0	0	2	2	2	2	−2	2	4	69
6885.3	0.8595	2,g	1	0	0	0	0	8	2	1	8	70
6885.4	0.8753	1,u								0	13	<25
6888.1	0.8660	0,u^+	0	1	0	5	3	5	−3	1	10	31
6888.4	0.8660	0,g^-	0	1	0	4	−4	6	4	1	10	27
		0,g^-	0	1	0	4	−2	6	2	1	10	25
6889.3	0.8474	0,g^-	0	0	2	2	−2	2	2	2	4	100
6890.0	0.8659	2,g	0	1	0	6	6	4	−4	1	10	61
6892.8	0.8659	2,u	0	1	0	5	5	5	−3	1	10	34
6893.7	0.8474	2,g	0	0	2	2	2	2	0	2	4	52
		2,g	0	0	2	2	0	2	2	2	4	41
6898.4	0.8474	0,g^+	0	0	2	2	2	2	−2	2	4	30
		0,g^+	0	0	2	2	0	2	0	2	4	51
6898.8	0.8431	1,g	2	0	0	1	1	2	0	2	3	54
		1,g	2	0	0	1	−1	2	2	2	3	45
6901.2	0.8659	2,g	0	1	0	6	6	4	−4	1	10	33
6902.5	0.8752	1,g	0	0	0	11	1	2	0	0	13	30
6902.8	0.8659	0,u^-	0	1	0	5	−5	5	5	1	10	69
6903.1	0.8474	2,g	0	0	2	2	2	2	0	2	4	35
		2,g	0	0	2	2	0	2	2	2	4	51
6906.1	0.8659	0,g^+	0	1	0	4	4	6	−4	1	10	37
		0,g^+	0	1	0	6	4	4	−4	1	10	45

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
6906.8	0.8431	1,g	2	0	0	1	1	2	0	2	3	44
		1,g	2	0	0	1	−1	2	2	2	3	55
6910.4	0.8474	0,u^+	0	0	2	1	1	3	−1	2	4	93
6910.6	0.8659	2,u								1	10	<25
6911.4	0.8659	0,u^+	0	1	0	5	5	5	−5	1	10	76
6918.0	0.8475	2,u	0	0	2	1	1	3	1	2	4	39
		2,u	0	0	2	1	−1	3	3	2	4	56
6919.5	0.8751	1,u	0	0	0	12	2	1	−1	0	13	30
		1,u	0	0	0	12	0	1	1	0	13	48
6920.2	0.8659	2,g								1	10	<25
6920.6	0.8474	0,u^-	0	0	2	1	−1	3	1	2	4	86
6921.1	0.8659	0,g^-	0	1	0	6	−4	4	4	1	10	42
6922.8	0.8659	0,u^-	0	1	0	5	−5	5	5	1	10	28
		0,u^-	0	1	0	5	−3	5	3	1	10	39
6926.2	0.8474	2,u	0	0	2	1	1	3	1	2	4	48
		2,u	0	0	2	1	−1	3	3	2	4	43
6929.5	0.8659	2,u								1	10	<25
6933.4	0.8413	0,u^+	0	2	1	2	0	0	0	3	2	99
6934.6	0.8749	1,g	0	0	0	13	1	0	0	0	13	94
6934.8	0.8659	0,u^+	0	1	0	7	3	3	−3	1	10	28
		0,u^+	0	1	0	7	1	3	−1	1	10	34
6935.0	0.8659	0,g^+	0	1	0	6	2	4	−2	1	10	41
6935.9	0.8413	2,u	0	2	1	2	2	0	0	3	2	100
6936.8	0.8659	2,u	0	1	0	5	5	5	−3	1	10	36
		2,u	0	1	0	7	5	3	−3	1	10	42
6938.1	0.8659	2,g	0	1	0	4	−4	6	6	1	10	44
6938.6	0.8660	0,g^+								1	10	<25
6938.7	0.8660	0,u^-	0	1	0	7	−1	3	1	1	10	31
6940.0	0.8475	0,g^+	0	0	2	0	0	4	0	2	4	89
6942.2	0.8432	1,u	2	0	0	0	0	3	1	2	3	98
6942.8	0.8659	2,g	0	1	0	8	4	2	−2	1	10	30
6944.9	0.8659	2,u								1	10	<25
6946.1	0.8659	0,g^-	0	1	0	4	−4	6	4	1	10	28
		0,g^-	0	1	0	8	−2	2	2	1	10	28
6946.9	0.8496	1,g	1	1	0	5	1	0	0	2	5	89
6947.1	0.8659	0,g^+	0	1	0	4	4	6	−4	1	10	33
6947.2	0.8475	2,g	0	0	2	0	0	4	2	2	4	91
6947.5	0.8659	0,u^+	0	1	0	3	3	7	−3	1	10	28
		0,u^+	0	1	0	7	3	3	−3	1	10	35
6948.1	0.8659	2,g								1	10	<25
6952.6	0.8659	0,u^-	0	1	0	7	−3	3	3	1	10	50
6952.9	0.8659	2,u	0	1	0	5	−3	5	5	1	10	25
6953.8	0.8497	1,u	1	1	0	4	2	1	−1	2	5	64
		1,u	1	1	0	4	0	1	1	2	5	30
6955.7	0.8659	2,u	0	1	0	7	−1	3	3	1	10	25
6955.9	0.8660	2,g	0	1	0	4	−4	6	6	1	10	32
6956.7	0.8660	0,g^-	0	1	0	4	−4	6	4	1	10	29
6957.9	0.8659	0,u^+	0	1	0	5	1	5	−1	1	10	30
6958.1	0.8659	2,g	0	1	0	8	0	2	2	1	10	31
6959.2	0.8414	0,g^+	0	2	1	1	1	1	−1	3	2	100
6961.1	0.8659	0,g^+								1	10	<25
6965.9	0.8659	2,u	0	1	0	7	−1	3	3	1	10	26
6966.3	0.8414	0,g^-	0	2	1	1	−1	1	1	3	2	100
6967.5	0.8497	1,u	1	1	0	4	2	1	−1	2	5	28
		1,u	1	1	0	4	0	1	1	2	5	58
6969.5	0.8414	2,g	0	2	1	1	1	1	1	3	2	100
6971.6	0.8659	2,g	0	1	0	4	4	6	−2	1	10	29
6972.3	0.8497	1,g	1	1	0	3	3	2	−2	2	5	74
6976.5	0.8657	0,u^+	0	1	0	9	1	1	−1	1	10	72
6977.0	0.8777	0,u^-	0	0	0	5	−1	9	1	0	14	28
6977.0	0.8777	0,g^+								0	14	<25
6978.3	0.8657	2,u	0	1	0	9	3	1	−1	1	10	54
6978.4	0.8660	0,g^+								1	10	<25
6980.5	0.8497	1,g	1	1	0	3	−1	2	2	2	5	56

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
6982.2	0.8660	2,g								1	10	<25
6985.0	0.8777	2,u								0	14	<25
6985.0	0.8777	2,g								0	14	<25
6985.3	0.8659	0,g^-	0	1	0	2	−2	8	2	1	10	27
		0,g^-	0	1	0	8	−2	2	2	1	10	51
6987.8	0.8660	0,u^-	0	1	0	3	−3	7	3	1	10	44
		0,u^-	0	1	0	5	−3	5	3	1	10	33
6990.2	0.8660	2,u	0	1	0	3	−3	7	5	1	10	45
6990.2	0.8659	2,g								1	10	<25
6990.5	0.8659	0,g^+								1	10	<25
6991.0	0.8497	1,g	1	1	0	3	1	2	0	2	5	45
		1,g	1	1	0	3	−1	2	2	2	5	31
6991.3	0.8659	0,u^-	0	1	0	1	−1	9	1	1	10	26
		0,u^-	0	1	0	9	−1	1	1	1	10	41
6991.8	0.8660	0,u^+	0	1	0	3	3	7	−3	1	10	32
		0,u^+	0	1	0	3	1	7	−1	1	10	37
6994.3	0.8353	0,g^+	0	4	0	0	0	0	0	4	0	100
6996.1	0.8659	2,u	0	1	0	9	1	1	1	1	10	39
6996.4	0.8658	2,g	0	1	0	8	0	2	2	1	10	32
6997.7	0.8414	0,u^+	0	2	1	0	0	2	0	3	2	99
7001.7	0.8660	2,u	0	1	0	3	3	7	−1	1	10	31
7002.2	0.8625	1,g								1	9	<25
7002.2	0.8625	1,u								1	9	<25
7004.0	0.8660	0,u^+								1	10	<25
7004.5	0.8498	1,u	1	1	0	2	2	3	−1	2	5	33
		1,u	1	1	0	2	0	3	1	2	5	31
		1,u	1	1	0	2	−2	3	3	2	5	32
7005.6	0.8414	2,u	0	2	1	0	0	2	2	3	2	100
7009.6	0.8660	2,u								1	10	<25
7009.7	0.8498	1,u	1	1	0	2	2	3	−1	2	5	40
		1,u	1	1	0	2	−2	3	3	2	5	56
7013.6	0.8657	0,g^+	0	1	0	10	0	0	0	1	10	72
7016.7	0.8657	2,g	0	1	0	10	2	0	0	1	10	69
7018.2	0.8661	0,g^+	0	1	0	2	2	8	−2	1	10	43
		0,g^+	0	1	0	2	0	8	0	1	10	27
7019.1	0.8498	1,u	1	1	0	2	0	3	1	2	5	50
7021.9	0.8660	0,g^-	0	1	0	2	−2	8	2	1	10	37
		0,g^-	0	1	0	4	−2	6	2	1	10	36
7022.6	0.8661	2,g	0	1	0	2	−2	8	4	1	10	42
7022.7	0.8625	1,u	0	0	1	5	5	4	−4	1	9	29
7023.1	0.8625	1,g	0	0	1	4	4	5	−3	1	9	28
7023.7	0.8659	0,u^-	0	1	0	9	−1	1	1	1	10	45
7028.5	0.8659	2,u	0	1	0	9	1	1	1	1	10	29
7029.9	0.8661	2,g	0	1	0	2	2	8	0	1	10	34
7031.2	0.8625	1,u	0	0	1	5	5	4	−4	1	9	61
7035.3	0.8625	1,g								1	9	<25
7038.4	0.8660	0,g^+	0	1	0	0	0	10	0	1	10	31
7040.9	0.8499	1,g	1	1	0	1	1	4	0	2	5	46
		1,g	1	1	0	1	−1	4	2	2	5	48
7041.1	0.8624	1,u								1	9	<25
7042.8	0.8662	0,u^+	0	1	0	1	1	9	−1	1	10	65
7043.9	0.8660	2,g	0	1	0	0	0	10	2	1	10	32
7045.5	0.8624	1,g	0	0	1	4	−4	5	5	1	9	37
7049.1	0.8662	2,u	0	1	0	1	1	9	1	1	10	29
		2,u	0	1	0	1	−1	9	3	1	10	37
7049.8	0.8499	1,g	1	1	0	1	1	4	0	2	5	43
		1,g	1	1	0	1	−1	4	2	2	5	44
7053.5	0.8624	1,u	0	0	1	5	−1	4	2	1	9	26
		1,u	0	0	1	5	−3	4	4	1	9	29
7056.2	0.8625	1,g	0	0	1	4	−4	5	5	1	9	47
7056.7	0.8777	0,u^+	0	0	0	5	3	9	−3	0	14	26
7056.8	0.8777	0,g^-								0	14	<25
7058.9	0.8660	0,u^-	0	1	0	3	−1	7	1	1	10	29
		0,u^-	0	1	0	5	−1	5	1	1	10	26

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7064.4	0.8777	2,g								0	14	<25
7064.5	0.8777	2,u								0	14	<25
7065.3	0.8660	2,u								1	10	<25
7066.8	0.8624	1,g	0	0	1	4	4	5	−3	1	9	41
		1,g	0	0	1	6	4	3	−3	1	9	45
7067.6	0.8662	0,g^+	0	1	0	0	0	10	0	1	10	39
7068.3	0.8624	1,u	0	0	1	3	3	6	−2	1	9	27
		1,u	0	0	1	7	3	2	−2	1	9	53
7069.5	0.8625	1,g								1	9	<25
7069.8	0.8624	1,u	0	0	1	7	1	2	0	1	9	40
7073.5	0.8624	1,g								1	9	<25
7074.3	0.8662	2,g	0	1	0	0	0	10	2	1	10	40
7075.2	0.8624	1,u	0	0	1	7	−1	2	2	1	9	44
7075.3	0.8461	0,u^+	1	0	1	4	0	0	0	2	4	92
7077.9	0.8461	2,u	1	0	1	4	2	0	0	2	4	94
7079.4	0.8499	1,u	1	1	0	0	0	5	1	2	5	92
7081.1	0.8625	1,g	0	0	1	6	−2	3	3	1	9	38
7082.6	0.8378	1,g	0	1	2	1	1	0	0	3	1	99
7085.7	0.8462	0,g^+	1	0	1	3	1	1	−1	2	4	96
7087.6	0.8462	2,g	1	0	1	3	3	1	−1	2	4	83
7088.7	0.8625	1,u	0	0	1	3	−3	6	4	1	9	45
7095.3	0.8623	1,g	0	0	1	8	2	1	−1	1	9	36
7095.8	0.8625	1,u	0	0	1	3	3	6	−2	1	9	32
7097.3	0.8462	0,g^-	1	0	1	3	−1	1	1	2	4	92
7101.1	0.8462	2,g	1	0	1	3	1	1	1	2	4	77
7104.9	0.8776	0,u^-	0	0	0	7	−7	7	7	0	14	27
7107.1	0.8777	0,g^+	0	0	0	6	6	8	−6	0	14	29
7107.6	0.8463	0,u^+	1	0	1	2	2	2	−2	2	4	66
		0,u^+	1	0	1	2	0	2	0	2	4	31
7107.8	0.8625	1,u								1	9	<25
7111.4	0.8563	1,u	0	2	0	6	2	1	−1	2	7	51
7111.4	0.8623	1,u	0	0	1	9	1	0	0	1	9	42
7111.5	0.8776	2,g	0	0	0	8	8	6	−6	0	14	28
7112.3	0.8624	1,g	0	0	1	8	0	1	1	1	9	35
7112.8	0.8463	0,u^-	1	0	1	2	−2	2	2	2	4	100
7113.0	0.8563	1,g	0	2	0	5	1	2	0	2	7	49
7114.6	0.8777	2,u								0	14	<25
7114.6	0.8336	0,g^+	2	1	0	0	0	0	0	3	0	99
7115.3	0.8379	1,u	0	1	2	0	0	1	1	3	1	99
7115.4	0.8626	1,g	0	0	1	2	−2	7	3	1	9	31
7116.8	0.8463	2,u	1	0	1	2	2	2	0	2	4	63
		2,u	1	0	1	2	0	2	2	2	4	34
7116.9	0.8564	1,g	0	2	0	5	3	2	−2	2	7	57
7118.9	0.8564	1,u	0	2	0	4	0	3	1	2	7	32
		1,u	0	2	0	6	0	1	1	2	7	34
7122.0	0.8463	0,u^+	1	0	1	2	2	2	−2	2	4	33
		0,u^+	1	0	1	2	0	2	0	2	4	56
7123.9	0.8777	0,u^-	0	0	0	7	−1	7	1	0	14	26
7124.3	0.8564	1,u	0	2	0	4	4	3	−3	2	7	95
7124.8	0.8564	1,g	0	2	0	5	−1	2	2	2	7	65
7125.2	0.8625	1,g								1	9	<25
7125.4	0.8777	0,g^+								0	14	<25
7126.9	0.8463	2,u	1	0	1	2	2	2	0	2	4	31
		2,u	1	0	1	2	0	2	2	2	4	62
7129.1	0.8777	2,g								0	14	<25
7130.1	0.8623	1,u	0	0	1	9	1	0	0	1	9	48
7132.2	0.8777	2,u								0	14	<25
7132.7	0.8776	0,u^+	0	0	0	7	7	7	−7	0	14	78
7136.7	0.8564	1,u	0	2	0	4	−2	3	3	2	7	69
7137.3	0.8563	1,g	0	2	0	7	1	0	0	2	7	63
7139.8	0.8627	1,u	0	0	1	1	1	8	0	1	9	27
		1,u	0	0	1	1	−1	8	2	1	9	32
7140.1	0.8464	0,g^+	1	0	1	1	1	3	−1	2	4	96
7140.3	0.8776	2,g	0	0	0	8	8	6	−6	0	14	30

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7140.8	0.8625	1,g	0	0	1	0	0	9	1	1	9	36
7142.8	0.8564	1,u	0	2	0	4	2	3	−1	2	7	30
7148.1	0.8464	2,g	1	0	1	1	1	3	1	2	4	49
		2,g	1	0	1	1	−1	3	3	2	4	49
7149.6	0.8464	0,g^-	1	0	1	1	−1	3	1	2	4	92
7150.0	0.8776	0,g^-	0	0	0	6	−6	8	6	0	14	44
7154.2	0.8565	1,g	0	2	0	3	−3	4	4	2	7	89
7155.3	0.8564	1,u	0	2	0	6	0	1	1	2	7	36
7155.8	0.8464	2,g	1	0	1	1	1	3	1	2	4	45
		2,g	1	0	1	1	−1	3	3	2	4	51
7156.3	0.8776	0,u^-	0	0	0	7	−7	7	7	0	14	57
7157.7	0.8776	2,u	0	0	0	7	7	7	−5	0	14	26
7157.9	0.8565	1,g	0	2	0	3	3	4	−2	2	7	65
7161.3	0.8625	1,u								1	9	<25
7166.6	0.8776	2,g	0	0	0	6	−6	8	8	0	14	40
7166.6	0.8626	1,g	0	0	1	0	0	9	1	1	9	29
7166.8	0.8565	1,g	0	2	0	3	−1	4	2	2	7	35
7171.4	0.8402	0,g^+	1	2	0	2	0	0	0	3	2	99
7173.7	0.8402	2,g	1	2	0	2	2	0	0	3	2	100
7175.0	0.8776	0,u^+								0	14	<25
7176.2	0.8464	0,u^+	1	0	1	0	0	4	0	2	4	94
7177.5	0.8564	1,g	0	2	0	5	1	2	0	2	7	29
7178.2	0.8776	0,g^-								0	14	<25
7183.4	0.8776	2,g								0	14	<25
7183.7	0.8464	2,u	1	0	1	0	0	4	2	2	4	95
7184.0	0.8776	2,u								0	14	<25
7187.9	0.8566	1,u	0	2	0	2	0	5	1	2	7	27
		1,u	0	2	0	2	−2	5	3	2	7	44
7189.7	0.8776	0,g^+	0	0	0	8	6	6	−6	0	14	61
7192.7	0.8565	1,u	0	2	0	2	2	5	−1	2	7	44
		1,u	0	2	0	2	−2	5	3	2	7	31
7196.7	0.8775	2,u	0	0	0	9	7	5	−5	0	14	50
7200.1	0.8777	0,u^+	0	0	0	5	5	9	−5	0	14	43
7203.1	0.8565	1,u								2	7	<25
7203.9	0.8403	0,u^+	1	2	0	1	1	1	−1	3	2	100
7204.0	0.8776	0,g^+	0	0	0	6	6	8	−6	0	14	53
7205.5	0.8776	0,u^-	0	0	0	7	−5	7	5	0	14	28
7205.9	0.8775	0,g^-	0	0	0	8	−6	6	6	0	14	63
7207.4	0.8776	2,u								0	14	<25
7208.7	0.8777	2,g								0	14	<25
7211.1	0.8403	0,u^-	1	2	0	1	−1	1	1	3	2	100
7212.2	0.8776	2,g	0	0	0	8	6	6	−4	0	14	28
7214.2	0.8403	2,u	1	2	0	1	1	1	1	3	2	100
7216.6	0.8614	1,g								1	9	<25
7216.6	0.8614	1,u								1	9	<25
7219.7	0.8776	2,u	0	0	0	5	−5	9	7	0	14	32
7220.7	0.8566	1,g	0	2	0	1	1	6	0	2	7	39
		1,g	0	2	0	1	−1	6	2	2	7	48
7226.7	0.8776	0,g^+								0	14	<25
7230.2	0.8344	0,u^+	0	0	3	0	0	0	0	3	0	99
7230.4	0.8566	1,g	0	2	0	1	1	6	0	2	7	35
		1,g	0	2	0	1	−1	6	2	2	7	29
7231.5	0.8613	1,g	1	0	0	5	5	4	−4	1	9	45
7232.3	0.8613	1,u	1	0	0	6	4	3	−3	1	9	34
7234.1	0.8777	0,u^-								0	14	<25
7234.5	0.8776	0,u^+	0	0	0	9	5	5	−5	0	14	34
7236.6	0.8777	2,u								0	14	<25
7237.8	0.8776	2,g								0	14	<25
7239.1	0.8613	1,g	1	0	0	5	5	4	−4	1	9	45
7240.7	0.8776	0,g^+								0	14	<25
7241.9	0.8613	1,u	1	0	0	6	2	3	−1	1	9	25
7242.6	0.8529	0,g^+	0	1	1	5	1	1	−1	2	6	77
7243.8	0.8529	0,u^+	0	1	1	4	0	2	0	2	6	49
		0,u^+	0	1	1	6	0	0	0	2	6	36

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7244.2	0.8529	2,g	0	1	1	5	3	1	−1	2	6	68
7244.7	0.8776	2,g								0	14	<25
7245.9	0.8613	1,g								1	9	<25
7246.5	0.8529	2,u	0	1	1	4	4	2	−2	2	6	30
		2,u	0	1	1	4	2	2	0	2	6	39
		2,u	0	1	1	6	2	0	0	2	6	27
7247.1	0.8776	2,u								0	14	<25
7249.2	0.8403	0,g^+	1	2	0	0	0	2	0	3	2	99
7250.9	0.8529	2,u	0	1	1	4	4	2	−2	2	6	65
7251.4	0.8613	1,u	1	0	0	6	0	3	1	1	9	26
7251.7	0.8529	0,g^-	0	1	1	3	−1	3	1	2	6	40
		0,g^-	0	1	1	5	−1	1	1	2	6	53
7253.0	0.8529	0,u^+	0	1	1	4	2	2	−2	2	6	69
7253.1	0.8567	1,u	0	2	0	0	0	7	1	2	7	79
7254.0	0.8775	0,u^-	0	0	0	7	−5	7	5	0	14	26
		0,u^-	0	0	0	9	−5	5	5	0	14	51
7255.6	0.8529	0,u^-	0	1	1	4	−2	2	2	2	6	82
7255.7	0.8775	0,u^+	0	0	0	7	5	7	−5	0	14	31
		0,u^+	0	0	0	9	5	5	−5	0	14	41
7256.7	0.8529	2,g	0	1	1	3	1	3	1	2	6	31
		2,g	0	1	1	5	1	1	1	2	6	49
7257.3	0.8403	2,g	1	2	0	0	0	2	2	3	2	99
7258.4	0.8774	2,g	0	0	0	10	6	4	−4	0	14	69
7258.4	0.8777	0,g^-	0	0	0	6	−4	8	4	0	14	43
7260.3	0.8776	0,u^-								0	14	<25
7260.7	0.8613	1,g	1	0	0	5	−3	4	4	1	9	48
7261.2	0.8776	0,g^-	0	0	0	8	−4	6	4	0	14	39
7263.8	0.8529	2,u	0	1	1	4	0	2	2	2	6	60
7265.7	0.8777	2,g	0	0	0	6	−4	8	6	0	14	29
7265.8	0.8530	0,g^+	0	1	1	3	3	3	−3	2	6	81
7266.7	0.8776	2,u								0	14	<25
7267.3	0.8530	0,g^-	0	1	1	3	−3	3	3	2	6	97
7267.4	0.8614	1,u	1	0	0	4	−4	5	5	1	9	72
7268.6	0.8529	0,u^+	0	1	1	6	0	0	0	2	6	44
7268.7	0.8776	2,u								0	14	<25
7269.3	0.8612	1,u	1	0	0	8	2	1	−1	1	9	45
7270.6	0.8776	2,g								0	14	<25
7270.7	0.8613	1,g	1	0	0	7	3	2	−2	1	9	43
7272.4	0.8529	2,u	0	1	1	6	2	0	0	2	6	34
7272.7	0.8776	0,u^+	0	0	0	9	3	5	−3	0	14	43
7275.6	0.8613	1,g	1	0	0	7	1	2	0	1	9	36
7276.2	0.8530	2,g	0	1	1	3	3	3	−1	2	6	52
7276.6	0.8613	1,u	1	0	0	4	4	5	−3	1	9	35
7276.6	0.8530	0,g^+	0	1	1	3	1	3	−1	2	6	51
7276.8	0.8776	0,g^+	0	0	0	6	4	8	−4	0	14	32
7277.2	0.8613	1,u								1	9	<25
7279.2	0.8777	0,u^-	0	0	0	7	−3	7	3	0	14	26
7279.7	0.8613	1,g	1	0	0	7	−1	2	2	1	9	54
7280.4	0.8776	0,g^-	0	0	0	4	−4	10	4	0	14	28
		0,g^-	0	0	0	8	−2	6	2	0	14	31
7280.5	0.8776	2,g								0	14	<25
7281.6	0.8776	2,u								0	14	<25
7282.1	0.8530	2,g	0	1	1	3	−1	3	3	2	6	65
7288.1	0.8530	0,g^-	0	1	1	1	−1	5	1	2	6	26
		0,g^-	0	1	1	3	−1	3	1	2	6	29
		0,g^-	0	1	1	5	−1	1	1	2	6	43
7288.3	0.8776	2,u								0	14	<25
7290.1	0.8777	2,g								0	14	<25
7291.2	0.8468	0,g^+	0	3	0	4	0	0	0	3	4	95
7291.8	0.8614	1,u	1	0	0	6	−2	3	3	1	9	25
7292.9	0.8530	2,g	0	1	1	3	1	3	1	2	6	25
		2,g	0	1	1	5	1	1	1	2	6	30
7293.6	0.8468	2,g	0	3	0	4	2	0	0	3	4	96
7293.8	0.8530	0,u^+	0	1	1	2	2	4	−2	2	6	61

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,u^+$	0	1	1	2	0	4	0	2	6	27
7296.8	0.8774	$0,g^+$	0	0	0	10	4	4	−4	0	14	48
7296.9	0.8776	$0,u^-$	0	0	0	9	−3	5	3	0	14	52
7297.3	0.8613	$1,u$								1	9	<25
7299.5	0.8776	$0,g^-$	0	0	0	10	−4	4	4	0	14	26
7299.9	0.8530	$0,u^-$	0	1	1	2	−2	4	2	2	6	82
7300.5	0.8531	$2,u$	0	1	1	2	−2	4	4	2	6	63
7301.0	0.8611	$1,g$	1	0	0	9	1	0	0	1	9	75
7301.6	0.8775	$2,u$	0	0	0	9	−3	5	5	0	14	28
7302.5	0.8775	$2,g$								0	14	<25
7304.2	0.8775	$0,g^-$	0	0	0	10	−4	4	4	0	14	44
7305.2	0.8615	$1,g$	1	0	0	3	−3	6	4	1	9	61
7305.9	0.8530	$2,u$	0	1	1	2	2	4	0	2	6	42
		$2,u$	0	1	1	2	−2	4	4	2	6	31
7306.7	0.8469	$0,u^+$	0	3	0	3	1	1	−1	3	4	97
7307.5	0.8775	$2,u$								0	14	<25
7308.3	0.8469	$2,u$	0	3	0	3	3	1	−1	3	4	83
7309.2	0.8775	$0,u^+$	0	0	0	9	1	5	−1	0	14	32
7310.6	0.8614	$1,g$	1	0	0	3	3	6	−2	1	9	48
7310.6	0.8530	$0,u^+$	0	1	1	2	0	4	0	2	6	26
7312.9	0.8777	$0,g^+$	0	0	0	0	0	14	0	0	14	27
7313.8	0.8613	$1,u$	1	0	0	8	0	1	1	1	9	34
7315.4	0.8368	$1,u$	1	1	1	1	1	0	0	3	1	99
7316.0	0.8530	$2,u$	0	1	1	2	0	4	2	2	6	28
7316.9	0.8775	$2,g$								0	14	<25
7317.3	0.8776	$0,u^-$	0	0	0	9	−1	5	1	0	14	28
7318.2	0.8774	$2,u$	0	0	0	11	5	3	−3	0	14	46
7318.7	0.8469	$0,u^-$	0	3	0	3	−1	1	1	3	4	94
7320.2	0.8614	$1,g$								1	9	<25
7320.9	0.8777	$2,g$								0	14	<25
7322.2	0.8775	$0,u^+$	0	0	0	7	1	7	−1	0	14	31
		$0,u^+$	0	0	0	9	1	5	−1	0	14	29
7322.3	0.8469	$2,u$	0	3	0	3	1	1	1	3	4	79
7322.6	0.8776	$2,u$								0	14	<25
7323.3	0.8775	$0,g^+$	0	0	0	8	2	6	−2	0	14	35
		$0,g^+$	0	0	0	8	0	6	0	0	14	39
7323.6	0.8531	$0,g^+$	0	1	1	1	1	5	−1	2	6	86
7326.5	0.8450	$0,g^+$	2	0	0	4	0	0	0	2	4	95
7326.9	0.8776	$0,u^-$	0	0	0	5	−3	9	3	0	14	26
7328.9	0.8450	$2,g$	2	0	0	4	2	0	0	2	4	96
7328.9	0.8776	$0,g^+$	0	0	0	6	2	8	−2	0	14	28
		$0,g^+$	0	0	0	6	0	8	0	0	14	38
7330.3	0.8776	$2,g$								0	14	<25
7330.3	0.8776	$0,u^+$	0	0	0	7	1	7	−1	0	14	32
7330.6	0.8531	$2,g$	0	1	1	1	1	5	1	2	6	35
		$2,g$	0	1	1	1	−1	5	3	2	6	54
7331.5	0.8775	$2,u$								0	14	<25
7333.0	0.8613	$1,g$								1	9	<25
7333.0	0.8776	$0,g^-$	0	0	0	10	−2	4	2	0	14	43
7333.5	0.8470	$0,g^+$	0	3	0	2	2	2	−2	3	4	65
		$0,g^+$	0	3	0	2	0	2	0	3	4	33
7335.0	0.8531	$0,g^-$	0	1	1	1	−1	5	1	2	6	67
		$0,g^-$	0	1	1	3	−1	3	1	2	6	29
7335.6	0.8774	$0,g^+$	0	0	0	10	2	4	−2	0	14	29
		$0,g^+$	0	0	0	10	0	4	0	0	14	29
7336.9	0.8774	$2,g$								0	14	<25
7338.7	0.8776	$2,u$								0	14	<25
7338.8	0.8470	$0,g^-$	0	3	0	2	−2	2	2	3	4	100
7339.1	0.8776	$0,u^+$	0	0	0	5	1	9	−1	0	14	47
7339.4	0.8615	$1,u$	1	0	0	2	−2	7	3	1	9	48
7340.1	0.8775	$2,g$								0	14	<25
7341.0	0.8531	$2,g$	0	1	1	1	1	5	1	2	6	41
		$2,g$	0	1	1	1	−1	5	3	2	6	30
7342.6	0.8470	$2,g$	0	3	0	2	2	2	0	3	4	67

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$2,g$	0	3	0	2	0	2	2	3	4	31
7342.7	0.8775	$2,u$								0	14	<25
7343.1	0.8615	$1,u$	1	0	0	2	2	7	−1	1	9	44
7343.4	0.8682	$1,u$								1	11	<25
7343.4	0.8682	$1,g$								1	11	<25
7343.5	0.8451	$0,u^+$	2	0	0	3	1	1	−1	2	4	97
7344.6	0.8774	$0,u^+$	0	0	0	11	1	3	−1	0	14	42
7345.0	0.8451	$2,u$	2	0	0	3	3	1	−1	2	4	83
7345.3	0.8776	$2,g$								0	14	<25
7345.9	0.8778	$0,g^+$								0	14	<25
7348.1	0.8470	$0,g^+$	0	3	0	2	2	2	−2	3	4	34
		$0,g^+$	0	3	0	2	0	2	0	3	4	58
7348.7	0.8777	$2,u$	0	0	0	5	1	9	1	0	14	27
7349.0	0.8773	$0,u^-$	0	0	0	11	−3	3	3	0	14	74
7351.8	0.8779	$0,u^+$	0	0	0	1	1	13	−1	0	14	38
		$0,u^+$	0	0	0	3	3	11	−3	0	14	27
7353.1	0.8470	$2,g$	0	3	0	2	2	2	0	3	4	29
		$2,g$	0	3	0	2	0	2	2	3	4	66
7354.5	0.8778	$2,g$								0	14	<25
7354.5	0.8532	$0,u^+$	0	1	1	0	0	6	0	2	6	79
7354.9	0.8368	$1,g$	1	1	1	0	0	1	1	3	1	99
7355.0	0.8614	$1,u$	1	0	0	0	0	9	1	1	9	26
7355.6	0.8451	$0,u^-$	2	0	0	3	−1	1	1	2	4	94
7356.7	0.8779	$0,g^+$	0	0	0	0	0	14	0	0	14	35
7359.2	0.8451	$2,u$	2	0	0	3	1	1	1	2	4	79
7360.2	0.8779	$2,u$								0	14	<25
7361.4	0.8532	$2,u$	0	1	1	0	0	6	2	2	6	82
7362.3	0.8777	$2,g$	0	0	0	0	0	14	2	0	14	29
7363.0	0.8773	$2,u$	0	0	0	11	1	3	1	0	14	28
7364.7	0.8775	$0,g^-$								0	14	<25
7368.7	0.8616	$1,g$	1	0	0	1	1	8	0	1	9	34
		$1,g$	1	0	0	1	−1	8	2	1	9	43
7368.7	0.8778	$0,g^+$	0	0	0	2	0	12	0	0	14	37
7370.0	0.8775	$2,g$	0	0	0	12	4	2	−2	0	14	38
7371.2	0.8470	$0,u^+$	0	3	0	1	1	3	−1	3	4	97
7371.4	0.8777	$0,u^+$	0	0	0	1	1	13	−1	0	14	27
		$0,u^+$	0	0	0	3	1	11	−1	0	14	32
7371.8	0.8452	$0,g^+$	2	0	0	2	2	2	−2	2	4	65
		$0,g^+$	2	0	0	2	0	2	0	2	4	33
7372.6	0.8776	$0,u^-$	0	0	0	11	−1	3	1	0	14	28
7373.1	0.8494	$1,u$	0	0	2	4	2	1	−1	2	5	58
		$1,u$	0	0	2	4	0	1	1	2	5	28
7373.7	0.8494	$1,g$	0	0	2	3	1	2	0	2	5	37
		$1,g$	0	0	2	5	1	0	0	2	5	56
7375.1	0.8777	$2,g$	0	0	0	2	0	12	2	0	14	34
7377.1	0.8452	$0,g^-$	2	0	0	2	−2	2	2	2	4	100
7378.0	0.8775	$2,u$								0	14	<25
7378.4	0.8774	$2,g$								0	14	<25
7378.4	0.8772	$0,g^+$	0	0	0	12	2	2	−2	0	14	55
		$0,g^+$	0	0	0	12	0	2	0	0	14	38
7379.0	0.8777	$2,u$	0	0	0	3	−1	11	3	0	14	27
7379.2	0.8470	$2,u$	0	3	0	1	1	3	1	3	4	53
		$2,u$	0	3	0	1	−1	3	3	3	4	45
7379.4	0.8615	$1,g$								1	9	<25
7380.2	0.8470	$0,u^-$	0	3	0	1	−1	3	1	3	4	94
7380.8	0.8452	$2,g$	2	0	0	2	2	2	0	2	4	68
		$2,g$	2	0	0	2	0	2	2	2	4	30
7381.4	0.8681	$1,u$								1	11	<25
7381.8	0.8681	$1,g$								1	11	<25
7382.4	0.8775	$0,u^+$	0	0	0	11	1	3	−1	0	14	25
7384.0	0.8494	$1,g$	0	0	2	3	3	2	−2	2	5	81
7384.0	0.8494	$1,u$	0	0	2	4	0	1	1	2	5	45
7386.4	0.8452	$0,g^+$	2	0	0	2	2	2	−2	2	4	35
		$0,g^+$	2	0	0	2	0	2	0	2	4	59

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7386.8	0.8470	2,*u*	0	3	0	1	1	3	1	3	4	42
		2,*u*	0	3	0	1	−1	3	3	3	4	55
7390.2	0.8495	1,*g*	0	0	2	3	−1	2	2	2	5	66
7390.9	0.8775	2,*u*	0	0	0	11	−1	3	3	0	14	26
7391.5	0.8452	2,*g*	2	0	0	2	2	2	0	2	4	29
		2,*g*	2	0	0	2	0	2	2	2	4	67
7395.9	0.8616	1,*u*	1	0	0	0	0	9	1	1	9	61
7397.6	0.8776	0,g^+								0	14	<25
7399.6	0.8681	1,*u*	0	1	0	6	6	5	−5	1	11	65
7400.5	0.8495	1,*g*	0	0	2	3	1	2	0	2	5	34
7402.4	0.8772	0,g^-	0	0	0	12	−2	2	2	0	14	87
7403.3	0.8775	2,*g*	0	0	0	12	2	2	0	0	14	27
7405.1	0.8495	1,*u*	0	0	2	2	−2	3	3	2	5	47
7405.7	0.8681	1,*g*								1	11	<25
7409.9	0.8773	2,*g*	0	0	0	12	0	2	2	0	14	49
7410.4	0.8495	1,*u*	0	0	2	2	2	3	−1	2	5	40
		1,*u*	0	0	2	2	−2	3	3	2	5	46
7410.9	0.8453	0,u^+	2	0	0	1	1	3	−1	2	4	97
7412.4	0.8471	0,g^+	0	3	0	0	0	4	0	3	4	95
7417.6	0.8681	1,*u*								1	11	<25
7419.0	0.8453	2,*u*	2	0	0	1	1	3	1	2	4	54
		2,*u*	2	0	0	1	−1	3	3	2	4	44
7419.0	0.8774	0,u^-	0	0	0	11	−1	3	1	0	14	38
7419.9	0.8453	0,u^-	2	0	0	1	−1	3	1	2	4	95
7420.0	0.8471	2,*g*	0	3	0	0	0	4	2	3	4	96
7420.6	0.8495	1,*u*	0	0	2	2	0	3	1	2	5	33
7423.2	0.8681	1,*g*	0	1	0	5	−5	6	6	1	11	50
7425.0	0.8773	2,*u*	0	0	0	13	3	1	−1	0	14	36
7426.5	0.8453	2,*u*	2	0	0	1	1	3	1	2	4	41
		2,*u*	2	0	0	1	−1	3	3	2	4	56
7427.3	0.8771	0,u^+	0	0	0	13	1	1	−1	0	14	96
7427.8	0.8799	1,*u*								0	15	<25
7427.8	0.8799	1,*g*								0	15	<25
7428.3	0.8772	2,*u*	0	0	0	13	3	1	−1	0	14	35
		2,*u*	0	0	0	13	1	1	1	0	14	32
7431.4	0.8496	1,*g*	0	0	2	1	1	4	0	2	5	38
		1,*g*	0	0	2	1	−1	4	2	2	5	50
7436.7	0.8681	1,*g*								1	11	<25
7436.9	0.8681	1,*u*								1	11	<25
7439.3	0.8434	1,*u*	0	2	1	3	1	0	0	3	3	97
7440.9	0.8681	1,*u*								1	11	<25
7441.3	0.8680	1,*g*	0	1	0	7	5	4	−4	1	11	31
7442.6	0.8496	1,*g*	0	0	2	1	1	4	0	2	5	39
		1,*g*	0	0	2	1	−1	4	2	2	5	34
7443.7	0.8772	0,g^+	0	0	0	12	2	2	−2	0	14	28
		0,g^+	0	0	0	12	0	2	0	0	14	43
7448.2	0.8680	1,*g*	0	1	0	5	5	6	−4	1	11	33
7449.7	0.8772	2,*g*	0	0	0	12	2	2	0	0	14	34
		2,*g*	0	0	0	12	0	2	2	0	14	31
7453.5	0.8680	1,*u*	0	1	0	8	4	3	−3	1	11	30
7453.7	0.8453	0,g^+	2	0	0	0	0	4	0	2	4	96
7454.1	0.8517	0,g^+	1	1	0	6	0	0	0	2	6	73
7455.4	0.8517	0,u^+	1	1	0	5	1	1	−1	2	6	88
7456.5	0.8517	2,*u*	1	1	0	5	3	1	−1	2	6	73
7456.7	0.8517	2,*g*	1	1	0	6	2	0	0	2	6	75
7457.1	0.8680	1,*g*	0	1	0	7	−3	4	4	1	11	28
7458.0	0.8434	1,*g*	0	2	1	2	2	1	−1	3	3	71
		1,*g*	0	2	1	2	0	1	1	3	3	29
7460.1	0.8497	1,*u*	0	0	2	0	0	5	1	2	5	82
7460.3	0.8333	0,g^+	1	0	2	0	0	0	0	3	0	99
7461.1	0.8680	1,*u*								1	11	<25
7461.3	0.8453	2,*g*	2	0	0	0	0	4	2	2	4	97
7466.6	0.8518	2,*g*	1	1	0	4	4	2	−2	2	6	90
7467.7	0.8680	1,*g*	0	1	0	7	−1	4	2	1	11	35

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7467.9	0.8518	$0,u^-$	1	1	0	3	−1	3	1	2	6	26
		$0,u^-$	1	1	0	5	−1	1	1	2	6	72
7468.1	0.8680	$1,u$								1	11	<25
7468.1	0.8435	$1,g$	0	2	1	2	2	1	−1	3	3	29
		$1,g$	0	2	1	2	0	1	1	3	3	68
7469.1	0.8771	$0,u^-$	0	0	0	13	−1	1	1	0	14	90
7469.7	0.8518	$0,g^+$	1	1	0	4	2	2	−2	2	6	69
7470.1	0.8680	$1,u$								1	11	<25
7470.7	0.8680	$1,g$								1	11	<25
7472.2	0.8518	$2,u$	1	1	0	5	1	1	1	2	6	62
7473.2	0.8771	$2,u$	0	0	0	13	1	1	1	0	14	63
7475.0	0.8518	$0,g^-$	1	1	0	4	−2	2	2	2	6	89
7481.3	0.8518	$2,g$	1	1	0	4	2	2	0	2	6	33
		$2,g$	1	1	0	4	0	2	2	2	6	43
7483.3	0.8647	$0,u^+$								1	10	<25
7483.3	0.8647	$0,g^-$	0	0	1	3	−1	7	1	1	10	36
		$0,g^-$	0	0	1	5	−1	5	1	1	10	25
7485.0	0.8681	$1,u$								1	11	<25
7486.3	0.8518	$0,g^+$	1	1	0	4	0	2	0	2	6	39
7487.9	0.8680	$1,g$								1	11	<25
7489.9	0.8519	$0,u^+$	1	1	0	3	3	3	−3	2	6	76
7490.5	0.8435	$1,u$	0	2	1	1	1	2	0	3	3	52
		$1,u$	0	2	1	1	−1	2	2	3	3	47
7490.6	0.8647	$2,u$								1	10	<25
7490.6	0.8647	$2,g$								1	10	<25
7491.0	0.8680	$1,g$								1	11	<25
7491.2	0.8518	$2,g$	1	1	0	4	2	2	0	2	6	25
		$2,g$	1	1	0	4	0	2	2	2	6	39
7491.6	0.8519	$0,u^-$	1	1	0	3	−3	3	3	2	6	96
7492.2	0.8770	$0,g^+$	0	0	0	14	0	0	0	0	14	98
7492.6	0.8680	$1,u$								1	11	<25
7493.2	0.8374	$1,g$	0	4	0	1	1	0	0	4	1	100
7494.3	0.8770	$2,g$	0	0	0	14	2	0	0	0	14	97
7498.5	0.8435	$1,u$	0	2	1	1	1	2	0	3	3	45
		$1,u$	0	2	1	1	−1	2	2	3	3	53
7499.1	0.8519	$2,u$	1	1	0	3	3	3	−1	2	6	65
7500.4	0.8519	$0,u^+$	1	1	0	3	1	3	−1	2	6	59
7501.6	0.8680	$1,g$								1	11	<25
7502.4	0.8680	$1,u$	0	1	0	10	2	1	−1	1	11	27
7504.0	0.8680	$1,g$	0	1	0	9	−1	2	2	1	11	31
7504.3	0.8680	$1,u$								1	11	<25
7506.8	0.8519	$2,u$	1	1	0	3	−1	3	3	2	6	67
7509.9	0.8681	$1,u$								1	11	<25
7510.9	0.8519	$0,u^-$	1	1	0	3	−1	3	1	2	6	51
		$0,u^-$	1	1	0	5	−1	1	1	2	6	27
7514.3	0.8646	$0,g^+$	0	0	1	3	3	7	−3	1	10	27
		$0,g^+$	0	0	1	5	3	5	−3	1	10	30
7514.5	0.8646	$0,u^-$	0	0	1	4	−4	6	4	1	10	29
		$0,u^-$	0	0	1	4	−2	6	2	1	10	28
7516.1	0.8519	$2,u$	1	1	0	3	1	3	1	2	6	38
7516.1	0.8681	$1,g$								1	11	<25
7518.9	0.8646	$2,u$	0	0	1	6	6	4	−4	1	10	39
7520.2	0.8646	$2,g$	0	0	1	5	5	5	−3	1	10	32
7521.1	0.8679	$1,u$	0	1	0	10	2	1	−1	1	11	35
7522.1	0.8798	$1,u$								0	15	<25
7522.2	0.8798	$1,g$								0	15	<25
7524.0	0.8519	$0,g^+$	1	1	0	2	2	4	−2	2	6	63
		$0,g^+$	1	1	0	2	0	4	0	2	6	30
7525.0	0.8682	$1,g$								1	11	<25
7528.5	0.8436	$1,g$	0	2	1	0	0	3	1	3	3	97
7529.2	0.8519	$0,g^-$	1	1	0	2	−2	4	2	2	6	89
7530.1	0.8646	$2,u$	0	0	1	6	6	4	−4	1	10	54
7530.7	0.8646	$0,g^-$	0	0	1	5	−5	5	5	1	10	69
7531.5	0.8520	$2,g$	1	1	0	2	0	4	2	2	6	27

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		2,*g*	1	1	0	2	−2	4	4	2	6	49
7533.8	0.8646	0,u^+	0	0	1	4	4	6	−4	1	10	45
		0,u^+	0	0	1	6	4	4	−4	1	10	37
7534.7	0.8681	1,*g*								1	11	<25
7535.6	0.8519	2,*g*	1	1	0	2	2	4	0	2	6	44
		2,*g*	1	1	0	2	−2	4	4	2	6	43
7538.1	0.8375	1,*u*	0	4	0	0	0	1	1	4	1	100
7539.0	0.8519	0,g^+	1	1	0	2	0	4	0	2	6	39
7539.1	0.8646	2,*g*	0	0	1	5	5	5	−3	1	10	27
7539.3	0.8646	0,g^+	0	0	1	5	5	5	−5	1	10	79
7544.8	0.8680	1,*u*	0	1	0	10	0	1	1	1	11	33
7544.8	0.8519	2,*g*	1	1	0	2	0	4	2	2	6	42
7545.0	0.8679	1,*g*	0	1	0	11	1	0	0	1	11	36
7547.6	0.8683	1,*u*	0	1	0	2	−2	9	3	1	11	33
7548.3	0.8646	2,*u*								1	10	<25
7549.8	0.8646	0,u^-	0	0	1	6	−4	4	4	1	10	37
7551.0	0.8646	0,g^-	0	0	1	5	−5	5	5	1	10	28
		0,g^-	0	0	1	5	−3	5	3	1	10	41
7551.3	0.8682	1,*u*	0	1	0	2	2	9	−1	1	11	31
7558.7	0.8646	2,*g*	0	0	1	5	−3	5	5	1	10	26
7560.3	0.8520	0,u^+	1	1	0	1	1	5	−1	2	6	91
7562.4	0.8678	1,*g*	0	1	0	11	1	0	0	1	11	60
7565.0	0.8646	0,u^+	0	0	1	6	2	4	−2	1	10	37
7565.3	0.8646	0,g^-	0	0	1	1	−1	9	1	1	10	28
		0,g^-	0	0	1	7	−1	3	1	1	10	27
7565.5	0.8646	2,*u*	0	0	1	4	−4	6	6	1	10	51
7566.2	0.8646	0,u^+	0	0	1	6	0	4	0	1	10	32
7566.6	0.8645	0,g^+	0	0	1	5	1	5	−1	1	10	29
7567.5	0.8520	2,*u*	1	1	0	1	1	5	1	2	6	41
		2,*u*	1	1	0	1	−1	5	3	2	6	52
7568.6	0.8645	2,*g*	0	0	1	7	5	3	−3	1	10	54
7569.2	0.8520	0,u^-	1	1	0	1	−1	5	1	2	6	78
7570.5	0.8681	1,*u*	0	1	0	0	0	11	1	1	11	28
7571.0	0.8683	1,*g*	0	1	0	1	1	10	0	1	11	31
		1,*g*	0	1	0	1	−1	10	2	1	11	30
7571.1	0.8646	2,*u*								1	10	<25
7572.3	0.8646	2,*g*								1	10	<25
7575.5	0.8646	0,u^-	0	0	1	4	−4	6	4	1	10	28
		0,u^-	0	0	1	6	−4	4	4	1	10	32
7575.6	0.8520	2,*u*	1	1	0	1	1	5	1	2	6	43
		2,*u*	1	1	0	1	−1	5	3	2	6	37
7577.3	0.8646	0,g^+	0	0	1	3	3	7	−3	1	10	32
		0,g^+	0	0	1	7	3	3	−3	1	10	33
7577.7	0.8798	1,*u*								0	15	<25
7577.7	0.8646	0,u^+	0	0	1	4	4	6	−4	1	10	39
		0,u^+	0	0	1	6	4	4	−4	1	10	31
7578.0	0.8798	1,*g*								0	15	<25
7578.0	0.8482	1,*u*	1	0	1	5	1	0	0	2	5	83
7579.3	0.8645	2,*u*	0	0	1	8	4	2	−2	1	10	31
7581.1	0.8399	0,g^+	0	1	2	2	0	0	0	3	2	98
7581.6	0.8483	1,*g*	1	0	1	4	2	1	−1	2	5	63
		1,*g*	1	0	1	4	0	1	1	2	5	30
7581.7	0.8646	2,*g*								1	10	<25
7582.8	0.8646	0,g^-	0	0	1	3	−3	7	3	1	10	29
		0,g^-	0	0	1	7	−3	3	3	1	10	53
7583.6	0.8646	2,*u*								1	10	<25
7583.7	0.8399	2,*g*	0	1	2	2	2	0	0	3	2	99
7584.0	0.8646	0,u^-	0	0	1	6	−2	4	2	1	10	26
7585.4	0.8646	2,*g*								1	10	<25
7587.8	0.8645	0,g^+	0	0	1	7	1	3	−1	1	10	36
7588.6	0.8681	1,*g*								1	11	<25
7589.6	0.8645	2,*u*								1	10	<25
7591.9	0.8646	0,u^+								1	10	<25
7592.1	0.8357	1,*g*	2	1	0	1	1	0	0	3	1	99

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7594.6	0.8483	1,g	1	0	1	4	2	1	−1	2	5	26
		1,g	1	0	1	4	0	1	1	2	5	55
7594.6	0.8646	2,g	0	0	1	7	−1	3	3	1	10	26
7594.9	0.8682	1,u	0	1	0	0	0	11	1	1	11	28
7596.7	0.8798	1,u								0	15	<25
7597.0	0.8484	1,u	1	0	1	3	3	2	−2	2	5	76
7597.2	0.8521	0,g^+	1	1	0	0	0	6	0	2	6	87
7597.8	0.8798	1,g								0	15	<25
7601.8	0.8645	2,u	0	0	1	8	4	2	−2	1	10	26
7603.2	0.8400	0,u^+	0	1	2	1	1	1	−1	3	2	99
7604.4	0.8521	2,g	1	1	0	0	0	6	2	2	6	88
7604.7	0.8484	1,u	1	0	1	3	−1	2	2	2	5	58
7607.0	0.8645	0,u^+								1	10	<25
7607.9	0.8646	2,u	0	0	1	6	−2	4	4	1	10	26
7610.3	0.8400	0,u^-	0	1	2	1	−1	1	1	3	2	99
7612.1	0.8646	0,g^+	0	0	1	3	3	7	−3	1	10	29
		0,g^+	0	0	1	9	1	1	−1	1	10	25
7613.4	0.8400	2,u	0	1	2	1	1	1	1	3	2	99
7613.6	0.8646	0,g^-	0	0	1	3	−3	7	3	1	10	34
		0,g^-	0	0	1	5	−3	5	3	1	10	35
7613.8	0.8647	2,g	0	0	1	3	−3	7	5	1	10	34
7615.0	0.8484	1,u	1	0	1	3	1	2	0	2	5	43
		1,u	1	0	1	3	−1	2	2	2	5	27
7616.5	0.8644	2,g	0	0	1	9	3	1	−1	1	10	50
7616.6	0.8646	0,g^+	0	0	1	9	1	1	−1	1	10	37
7617.2	0.8645	0,u^-	0	0	1	2	−2	8	2	1	10	27
		0,u^-	0	0	1	8	−2	2	2	1	10	59
7619.4	0.8797	1,u	0	0	0	8	8	7	−7	0	15	49
7621.0	0.8646	0,u^+								1	10	<25
7621.7	0.8646	0,g^-	0	0	1	1	−1	9	1	1	10	31
		0,g^-	0	0	1	9	−1	1	1	1	10	26
7621.9	0.8645	2,u	0	0	1	8	2	2	0	1	10	25
7623.1	0.8586	0,g^+	0	2	0	4	0	4	0	2	8	26
7623.2	0.8586	0,u^-	0	2	0	3	−1	5	1	2	8	32
		0,u^-	0	2	0	5	−1	3	1	2	8	38
7624.1	0.8798	1,g	0	0	0	7	−7	8	8	0	15	41
7624.6	0.8585	2,g	0	2	0	4	4	4	−2	2	8	30
		2,g	0	2	0	6	4	2	−2	2	8	60
7624.8	0.8585	2,u	0	2	0	5	5	3	−3	2	8	56
7625.3	0.8484	1,g	1	0	1	2	2	3	−1	2	5	30
		1,g	1	0	1	2	0	3	1	2	5	29
		1,g	1	0	1	2	−2	3	3	2	5	36
7626.2	0.8646	2,g								1	10	<25
7627.2	0.8585	2,u	0	2	0	5	5	3	−3	2	8	41
		2,u	0	2	0	5	3	3	−1	2	8	33
7627.6	0.8646	2,g	0	0	1	9	1	1	1	1	10	27
7627.7	0.8646	2,u	0	0	1	8	0	2	2	1	10	36
7628.4	0.8585	0,u^+	0	2	0	5	1	3	−1	2	8	34
		0,u^+	0	2	0	7	1	1	−1	2	8	40
7628.8	0.8585	2,g	0	2	0	4	2	4	0	2	8	26
		2,g	0	2	0	6	2	2	0	2	8	42
7630.4	0.8585	0,g^+	0	2	0	6	2	2	−2	2	8	44
		0,g^+	0	2	0	6	0	2	0	2	8	30
7630.5	0.8484	1,g	1	0	1	2	2	3	−1	2	5	40
		1,g	1	0	1	2	−2	3	3	2	5	54
7631.1	0.8585	0,g^-	0	2	0	4	−2	4	2	2	8	37
		0,g^-	0	2	0	6	−2	2	2	2	8	48
7633.3	0.8585	2,u	0	2	0	5	1	3	1	2	8	33
7633.4	0.8645	0,g^+	0	0	1	9	1	1	−1	1	10	30
7636.6	0.8648	0,u^+	0	0	1	2	2	8	−2	1	10	40
7637.3	0.8646	2,g								1	10	<25
7637.4	0.8585	0,u^+	0	2	0	5	3	3	−3	2	8	65
7637.9	0.8401	0,g^+	0	1	2	0	0	2	0	3	2	98
7638.1	0.8585	0,u^-	0	2	0	5	−3	3	3	2	8	70

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7638.5	0.8357	1,u	2	1	0	0	0	1	1	3	1	99
7640.1	0.8484	1,g	1	0	1	2	0	3	1	2	5	46
7641.1	0.8585	2,g	0	2	0	4	0	4	2	2	8	26
		2,g	0	2	0	6	0	2	2	2	8	42
7641.5	0.8648	2,u	0	0	1	2	−2	8	4	1	10	29
7645.8	0.8401	2,g	0	1	2	0	0	2	2	3	2	99
7646.7	0.8646	0,u^-	0	0	1	4	−2	6	2	1	10	33
		0,u^-	0	0	1	6	−2	4	2	1	10	26
7646.9	0.8586	0,g^+	0	2	0	4	4	4	−4	2	8	91
7647.0	0.8586	0,g^-	0	2	0	4	−4	4	4	2	8	90
7650.7	0.8798	1,u								0	15	<25
7652.7	0.8585	2,u	0	2	0	5	−1	3	3	2	8	50
7652.7	0.8645	0,u^+	0	0	1	10	0	0	0	1	10	50
7653.3	0.8646	2,u								1	10	<25
7654.1	0.8585	0,u^+	0	2	0	7	1	1	−1	2	8	53
7655.2	0.8585	2,u	0	2	0	7	3	1	−1	2	8	38
7655.7	0.8798	1,g	0	0	0	7	−7	8	8	0	15	27
7657.0	0.8644	2,u	0	0	1	10	2	0	0	1	10	56
7657.1	0.8645	0,g^-	0	0	1	9	−1	1	1	1	10	57
7658.0	0.8485	1,u	1	0	1	1	1	4	0	2	5	44
		1,u	1	0	1	1	−1	4	2	2	5	49
7658.3	0.8584	0,g^+	0	2	0	8	0	0	0	2	8	73
7659.6	0.8648	0,g^+	0	0	1	1	1	9	−1	1	10	50
		0,g^+	0	0	1	3	1	7	−1	1	10	26
7660.8	0.8584	2,g	0	2	0	8	2	0	0	2	8	61
7661.4	0.8585	2,g	0	2	0	4	4	4	−2	2	8	46
7661.8	0.8645	2,g	0	0	1	9	1	1	1	1	10	40
7662.8	0.8340	0,u^+	0	3	1	0	0	0	0	4	0	100
7665.1	0.8798	1,g	0	0	0	7	7	8	−6	0	15	25
7665.8	0.8648	2,g	0	0	1	1	1	9	1	1	10	26
		2,g	0	0	1	1	−1	9	3	1	10	25
7666.2	0.8586	0,g^+	0	2	0	4	2	4	−2	2	8	36
		0,g^+	0	2	0	4	0	4	0	2	8	25
7666.4	0.8585	0,u^-	0	2	0	7	−1	1	1	2	8	65
7667.3	0.8798	1,u								0	15	<25
7667.3	0.8645	0,u^+	0	0	1	10	0	0	0	1	10	42
7667.5	0.8485	1,u	1	0	1	1	1	4	0	2	5	43
		1,u	1	0	1	1	−1	4	2	2	5	41
7667.9	0.8423	1,g	1	2	0	3	1	0	0	3	3	98
7668.7	0.8586	2,g	0	2	0	4	−2	4	4	2	8	72
7670.7	0.8585	0,g^-	0	2	0	4	−2	4	2	2	8	28
		0,g^-	0	2	0	6	−2	2	2	2	8	47
7671.2	0.8585	2,u	0	2	0	7	1	1	1	2	8	52
7671.5	0.8645	2,u	0	0	1	0	0	10	2	1	10	27
		2,u	0	0	1	10	2	0	0	1	10	31
7677.9	0.8585	2,g								2	8	<25
7683.6	0.8586	0,u^+	0	2	0	3	3	5	−3	2	8	64
7683.9	0.8586	0,u^-	0	2	0	3	−3	5	3	2	8	72
7684.4	0.8585	0,g^+	0	2	0	6	0	2	0	2	8	33
7685.2	0.8586	2,u	0	2	0	3	−3	5	5	2	8	91
7685.5	0.8797	1,g	0	0	0	9	7	6	−6	0	15	49
7685.5	0.8646	0,g^-	0	0	1	5	−1	5	1	1	10	26
7688.2	0.8647	0,u^+								1	10	<25
7688.4	0.8797	1,u	0	0	0	8	−6	7	7	0	15	27
7689.0	0.8585	2,g	0	2	0	6	2	2	0	2	8	26
7691.2	0.8646	2,g								1	10	<25
7692.8	0.8486	1,g	1	0	1	0	0	5	1	2	5	90
7693.2	0.8423	1,u	1	2	0	2	2	1	−1	3	3	71
		1,u	1	2	0	2	0	1	1	3	3	28
7694.2	0.8586	2,u	0	2	0	3	3	5	−1	2	8	53
7694.3	0.8647	2,u								1	10	<25
7694.7	0.8636	0,u^-	1	0	0	3	−1	7	1	1	10	31
		0,u^-	1	0	0	5	−1	5	1	1	10	30
7694.7	0.8636	0,g^+								1	10	<25

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7695.3	0.8586	$0,u^+$	0	2	0	3	1	5	−1	2	8	40
		$0,u^+$	0	2	0	5	1	3	−1	2	8	26
7701.0	0.8586	$2,u$	0	2	0	3	−1	5	3	2	8	36
7701.1	0.8635	$2,g$								1	10	<25
7701.2	0.8636	$2,u$								1	10	<25
7703.6	0.8424	$1,u$	1	2	0	2	2	1	−1	3	3	28
		$1,u$	1	2	0	2	0	1	1	3	3	70
7705.5	0.8797	$1,g$								0	15	<25
7706.5	0.8586	$0,u^-$	0	2	0	1	−1	7	1	2	8	30
		$0,u^-$	0	2	0	5	−1	3	1	2	8	40
7709.2	0.8797	$1,u$	0	0	0	8	−6	7	7	0	15	33
7711.8	0.8586	$2,u$	0	2	0	5	1	3	1	2	8	29
7716.6	0.8587	$0,g^+$	0	2	0	2	2	6	−2	2	8	56
		$0,g^+$	0	2	0	2	0	6	0	2	8	29
7718.7	0.8798	$1,g$								0	15	<25
7719.3	0.8798	$1,u$								0	15	<25
7720.1	0.8587	$0,g^-$	0	2	0	2	−2	6	2	2	8	68
		$0,g^-$	0	2	0	4	−2	4	2	2	8	27
7720.3	0.8634	$2,g$	1	0	0	6	6	4	−4	1	10	72
7720.6	0.8798	$1,u$								0	15	<25
7720.8	0.8635	$0,u^+$	1	0	0	5	3	5	−3	1	10	31
7721.1	0.8635	$0,g^-$	1	0	0	4	−4	6	4	1	10	25
7722.1	0.8587	$2,g$	0	2	0	2	−2	6	4	2	8	64
7722.7	0.8798	$1,g$								0	15	<25
7723.9	0.8365	$1,u$	0	0	3	1	1	0	0	3	1	99
7724.4	0.8635	$2,u$	1	0	0	5	5	5	−3	1	10	34
		$2,u$	1	0	0	7	5	3	−3	1	10	25
7727.3	0.8587	$2,g$	0	2	0	2	2	6	0	2	8	49
7731.2	0.8586	$0,g^+$	0	2	0	4	0	4	0	2	8	26
7732.5	0.8424	$1,g$	1	2	0	1	1	2	0	3	3	54
		$1,g$	1	2	0	1	−1	2	2	3	3	45
7732.5	0.8635	$2,g$								1	10	<25
7734.1	0.8322	$0,u^+$	2	0	1	0	0	0	0	3	0	99
7734.5	0.8635	$0,u^-$	1	0	0	5	−5	5	5	1	10	66
7737.1	0.8586	$2,g$								2	8	<25
7737.5	0.8635	$0,g^+$	1	0	0	4	4	6	−4	1	10	30
		$0,g^+$	1	0	0	6	4	4	−4	1	10	49
7740.5	0.8424	$1,g$	1	2	0	1	1	2	0	3	3	44
		$1,g$	1	2	0	1	−1	2	2	3	3	55
7741.4	0.8635	$2,u$								1	10	<25
7743.3	0.8635	$0,u^+$	1	0	0	5	5	5	−5	1	10	73
7746.0	0.8797	$1,g$	0	0	0	9	−5	6	6	0	15	25
7748.1	0.8588	$0,u^+$	0	2	0	1	1	7	−1	2	8	82
7748.5	0.8797	$1,u$	0	0	0	10	6	5	−5	0	15	25
7751.0	0.8635	$2,g$								1	10	<25
7751.8	0.8635	$0,g^-$	1	0	0	6	−4	4	4	1	10	44
		$0,g^-$	1	0	0	6	−2	4	2	1	10	28
7752.7	0.8366	$1,g$	0	0	3	0	0	1	1	3	1	99
7753.9	0.8635	$0,u^-$	1	0	0	5	−5	5	5	1	10	31
		$0,u^-$	1	0	0	5	−3	5	3	1	10	35
7754.5	0.8550	$1,g$	0	1	1	4	2	3	−1	2	7	38
		$1,g$	0	1	1	6	2	1	−1	2	7	44
7754.7	0.8588	$2,u$	0	2	0	1	1	7	1	2	8	31
		$2,u$	0	2	0	1	−1	7	3	2	8	52
7755.0	0.8796	$1,u$	0	0	0	10	6	5	−5	0	15	35
7755.1	0.8550	$1,u$	0	1	1	5	1	2	0	2	7	48
7757.4	0.8550	$1,u$	0	1	1	5	3	2	−2	2	7	49
7757.6	0.8587	$0,u^-$	0	2	0	1	−1	7	1	2	8	52
		$0,u^-$	0	2	0	3	−1	5	1	2	8	34
7758.7	0.8550	$1,g$	0	1	1	4	0	3	1	2	7	41
		$1,g$	0	1	1	6	0	1	1	2	7	29
7759.4	0.8634	$2,u$								1	10	<25
7762.0	0.8797	$1,g$	0	0	0	7	−5	8	6	0	15	35
		$1,g$	0	0	0	9	−5	6	6	0	15	27

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7762.7	0.8634	$0,u^+$	1	0	0	7	3	3	−3	1	10	31
		$0,u^+$	1	0	0	7	1	3	−1	1	10	39
7763.0	0.8551	$1,g$	0	1	1	4	4	3	−3	2	7	96
7763.5	0.8634	$0,g^+$	1	0	0	6	2	4	−2	1	10	36
7763.8	0.8797	$1,g$								0	15	<25
7764.1	0.8587	$2,u$	0	2	0	1	1	7	1	2	8	35
7764.5	0.8550	$1,u$	0	1	1	3	−1	4	2	2	7	31
		$1,u$	0	1	1	5	−1	2	2	2	7	57
7765.6	0.8797	$1,u$								0	15	<25
7766.2	0.8634	$2,u$	1	0	0	5	5	5	−3	1	10	38
		$2,u$	1	0	0	7	5	3	−3	1	10	32
7769.0	0.8634	$2,g$	1	0	0	4	−4	6	6	1	10	29
		$2,g$	1	0	0	8	4	2	−2	1	10	25
7770.4	0.8635	$0,g^+$								1	10	<25
7770.6	0.8635	$0,u^-$	1	0	0	7	−1	3	1	1	10	33
7772.3	0.8634	$2,g$	1	0	0	6	2	4	0	1	10	26
		$2,g$	1	0	0	8	4	2	−2	1	10	32
7774.5	0.8551	$1,g$	0	1	1	4	−2	3	3	2	7	73
7775.8	0.8634	$0,g^+$	1	0	0	8	0	2	0	1	10	29
7776.0	0.8634	$0,g^-$	1	0	0	8	−2	2	2	1	10	40
7776.1	0.8635	$2,u$								1	10	<25
7776.4	0.8634	$0,u^+$	1	0	0	7	3	3	−3	1	10	31
		$0,u^+$	1	0	0	9	1	1	−1	1	10	25
7777.3	0.8425	$1,u$	1	2	0	0	0	3	1	3	3	98
7777.7	0.8634	$2,g$	1	0	0	8	2	2	0	1	10	32
7778.4	0.8588	$0,g^+$	0	2	0	0	0	8	0	2	8	72
7782.4	0.8550	$1,g$	0	1	1	6	2	1	−1	2	7	28
7782.7	0.8635	$0,u^-$	1	0	0	7	−3	3	3	1	10	44
7783.0	0.8549	$1,u$	0	1	1	7	1	0	0	2	7	75
7783.1	0.8634	$2,u$								1	10	<25
7785.0	0.8797	$1,g$								0	15	<25
7785.3	0.8588	$2,g$	0	2	0	0	0	8	2	2	8	73
7785.3	0.8634	$2,u$	1	0	0	7	−1	3	3	1	10	28
7786.6	0.8634	$2,g$	1	0	0	8	0	2	2	1	10	33
7787.1	0.8797	$1,u$								0	15	<25
7788.6	0.8635	$2,g$	1	0	0	4	−4	6	6	1	10	40
7788.6	0.8635	$0,u^+$	1	0	0	5	1	5	−1	1	10	42
7788.9	0.8551	$1,u$	0	1	1	3	−3	4	4	2	7	90
7789.2	0.8635	$0,g^-$	1	0	0	4	−4	6	4	1	10	39
7791.3	0.8635	$0,g^+$	1	0	0	4	4	6	−4	1	10	34
7793.9	0.8551	$1,u$	0	1	1	3	3	4	−2	2	7	59
7794.1	0.8798	$1,u$								0	15	<25
7794.3	0.8798	$1,g$								0	15	<25
7795.8	0.8550	$1,g$	0	1	1	6	0	1	1	2	7	41
7797.2	0.8635	$2,u$								1	10	<25
7800.7	0.8633	$0,u^+$	1	0	0	9	1	1	−1	1	10	62
7802.7	0.8633	$2,u$	1	0	0	9	3	1	−1	1	10	41
7802.9	0.8551	$1,u$	0	1	1	3	−1	4	2	2	7	29
7803.0	0.8635	$2,g$	1	0	0	4	4	6	−2	1	10	37
7804.0	0.8797	$1,u$								0	15	<25
7804.6	0.8388	$0,u^+$	1	1	1	2	0	0	0	3	2	98
7805.0	0.8798	$1,g$								0	15	<25
7806.6	0.8489	$1,g$	0	3	0	5	1	0	0	3	5	90
7806.6	0.8796	$1,g$	0	0	0	11	5	4	−4	0	15	26
7807.0	0.8388	$2,u$	1	1	1	2	2	0	0	3	2	99
7811.1	0.8798	$1,u$								0	15	<25
7811.7	0.8635	$0,g^+$	1	0	0	4	2	6	−2	1	10	28
7813.1	0.8796	$1,u$	0	0	0	10	−4	5	5	0	15	35
7814.8	0.8551	$1,u$	0	1	1	5	1	2	0	2	7	31
7814.8	0.8634	$0,g^-$	1	0	0	2	−2	8	2	1	10	27
		$0,g^-$	1	0	0	6	−2	4	2	1	10	31
		$0,g^-$	1	0	0	8	−2	2	2	1	10	39
7814.9	0.8490	$1,u$	0	3	0	4	2	1	−1	3	5	64
		$1,u$	0	3	0	4	0	1	1	3	5	31

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7815.6	0.8703	$0,u^-$	0	1	0	3	−1	9	1	1	12	28
		$0,u^-$	0	1	0	5	−1	7	1	1	12	28
7815.6	0.8703	$0,g^+$								1	12	<25
7815.9	0.8635	$2,g$								1	10	<25
7817.0	0.8633	$0,g^+$	1	0	0	10	0	0	0	1	10	47
7817.2	0.8796	$1,g$	0	0	0	11	5	4	−4	0	15	43
7818.4	0.8634	$0,u^-$	1	0	0	9	−1	1	1	1	10	53
7819.4	0.8634	$2,g$	1	0	0	10	2	0	0	1	10	27
7819.5	0.8552	$1,g$	0	1	1	2	0	5	1	2	7	26
		$1,g$	0	1	1	2	−2	5	3	2	7	43
7820.6	0.8471	$1,g$	2	0	0	5	1	0	0	2	5	91
7822.3	0.8796	$1,u$	0	0	0	10	4	5	−3	0	15	29
7822.9	0.8634	$2,g$	1	0	0	8	0	2	2	1	10	25
		$2,g$	1	0	0	10	2	0	0	1	10	28
7823.0	0.8797	$1,g$	0	0	0	9	−3	6	4	0	15	26
7823.1	0.8703	$2,u$								1	12	<25
7823.2	0.8703	$2,g$								1	12	<25
7823.4	0.8634	$2,u$	1	0	0	9	1	1	1	1	10	42
7823.4	0.8636	$0,u^-$	1	0	0	3	−3	7	3	1	10	45
7825.6	0.8552	$1,g$	0	1	1	2	2	5	−1	2	7	40
		$1,g$	0	1	1	2	−2	5	3	2	7	29
7825.9	0.8636	$2,u$	1	0	0	3	−3	7	5	1	10	48
7826.9	0.8636	$0,u^+$	1	0	0	3	3	7	−3	1	10	41
7827.2	0.8798	$1,u$								0	15	<25
7828.7	0.8490	$1,u$	0	3	0	4	2	1	−1	3	5	28
		$1,u$	0	3	0	4	0	1	1	3	5	59
7830.3	0.8472	$1,u$	2	0	0	4	2	1	−1	2	5	64
		$1,u$	2	0	0	4	0	1	1	2	5	31
7833.3	0.8389	$0,g^+$	1	1	1	1	1	1	−1	3	2	99
7833.4	0.8797	$1,g$								0	15	<25
7834.6	0.8490	$1,g$	0	3	0	3	3	2	−2	3	5	74
7836.4	0.8633	$0,g^+$	1	0	0	10	0	0	0	1	10	50
7836.5	0.8636	$2,u$	1	0	0	3	3	7	−1	1	10	39
7837.0	0.8551	$1,g$	0	1	1	4	0	3	1	2	7	26
7837.8	0.8636	$0,u^+$	1	0	0	3	1	7	−1	1	10	28
		$0,u^+$	1	0	0	5	1	5	−1	1	10	26
7840.2	0.8633	$2,g$	1	0	0	10	2	0	0	1	10	41
7840.4	0.8389	$0,g^-$	1	1	1	1	−1	1	1	3	2	99
7840.7	0.8796	$1,g$								0	15	<25
7843.0	0.8490	$1,g$	0	3	0	3	−1	2	2	3	5	55
7843.5	0.8389	$2,g$	1	1	1	1	1	1	1	3	2	99
7844.0	0.8636	$2,u$								1	10	<25
7844.1	0.8797	$1,u$								0	15	<25
7844.4	0.8472	$1,u$	2	0	0	4	2	1	−1	2	5	29
		$1,u$	2	0	0	4	0	1	1	2	5	60
7848.9	0.8553	$1,u$	0	1	1	1	1	6	0	2	7	36
		$1,u$	0	1	1	1	−1	6	2	2	7	46
7849.8	0.8796	$1,u$	0	0	0	10	−2	5	3	0	15	37
7850.3	0.8797	$1,g$								0	15	<25
7851.4	0.8473	$1,g$	2	0	0	3	3	2	−2	2	5	74
7852.5	0.8634	$0,u^-$	1	0	0	1	−1	9	1	1	10	25
		$0,u^-$	1	0	0	7	−1	3	1	1	10	31
		$0,u^-$	1	0	0	9	−1	1	1	1	10	30
7853.5	0.8491	$1,g$	0	3	0	3	1	2	0	3	5	46
		$1,g$	0	3	0	3	−1	2	2	3	5	32
7857.7	0.8634	$2,u$								1	10	<25
7857.8	0.8637	$0,g^+$	1	0	0	2	2	8	−2	1	10	47
		$0,g^+$	1	0	0	2	0	8	0	1	10	30
7858.0	0.8636	$0,g^-$	1	0	0	2	−2	8	2	1	10	47
		$0,g^-$	1	0	0	4	−2	6	2	1	10	35
7859.9	0.8473	$1,g$	2	0	0	3	−1	2	2	2	5	55
7861.0	0.8552	$1,u$	0	1	1	1	1	6	0	2	7	30
7861.2	0.8637	$2,g$	1	0	0	2	−2	8	4	1	10	51
7861.9	0.8796	$1,u$								0	15	<25

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7862.9	0.8796	1,g	0	0	0	11	−3	4	4	0	15	31
7865.5	0.8820	0,u^-	0	0	0	5	−1	11	1	0	16	28
7865.5	0.8820	0,g^+								0	16	<25
7865.6	0.8703	0,g^-								1	12	<25
7865.9	0.8703	0,u^+	0	1	0	5	3	7	−3	1	12	29
7867.3	0.8637	2,g	1	0	0	2	2	8	0	1	10	44
7867.4	0.8796	1,g								0	15	<25
7868.3	0.8491	1,u	0	3	0	2	2	3	−1	3	5	34
		1,u	0	3	0	2	0	3	1	3	5	32
		1,u	0	3	0	2	−2	3	3	3	5	31
7870.4	0.8799	1,u	0	0	0	0	0	15	1	0	15	41
7870.5	0.8473	1,g	2	0	0	3	1	2	0	2	5	46
		1,g	2	0	0	3	−1	2	2	2	5	33
7871.7	0.8702	2,u								1	12	<25
7871.8	0.8636	0,g^+	1	0	0	0	0	10	0	1	10	28
7872.5	0.8702	2,g								1	12	<25
7873.4	0.8491	1,u	0	3	0	2	2	3	−1	3	5	40
		1,u	0	3	0	2	−2	3	3	3	5	57
7873.6	0.8820	2,g								0	16	<25
7873.6	0.8820	2,u								0	16	<25
7874.6	0.8390	0,u^+	1	1	1	0	0	2	0	3	2	98
7876.8	0.8796	1,u	0	0	0	12	4	3	−3	0	15	33
7877.7	0.8797	1,g								0	15	<25
7877.9	0.8636	2,g	1	0	0	0	0	10	2	1	10	28
7878.3	0.8553	1,g	0	1	1	0	0	7	1	2	7	72
7878.7	0.8515	0,u^+	0	0	2	3	1	3	−1	2	6	32
		0,u^+	0	0	2	5	1	1	−1	2	6	65
7879.1	0.8797	1,u	0	0	0	6	−2	9	3	0	15	26
7879.5	0.8515	0,g^+	0	0	2	4	0	2	0	2	6	55
7880.8	0.8797	1,g	0	0	0	11	1	4	0	0	15	31
7881.0	0.8515	2,u	0	0	2	5	3	1	−1	2	6	61
7882.1	0.8515	2,g	0	0	2	4	4	2	−2	2	6	52
		2,g	0	0	2	4	2	2	0	2	6	34
7882.7	0.8390	2,u	1	1	1	0	0	2	2	3	2	99
7882.7	0.8491	1,u	0	3	0	2	0	3	1	3	5	52
7884.4	0.8638	0,u^+	1	0	0	1	1	9	−1	1	10	72
7885.4	0.8516	0,u^-	0	0	2	3	−1	3	1	2	6	48
		0,u^-	0	0	2	5	−1	1	1	2	6	40
7885.6	0.8800	1,g	0	0	0	1	−1	14	2	0	15	30
7886.6	0.8473	1,u	2	0	0	2	2	3	−1	2	5	35
		1,u	2	0	0	2	0	3	1	2	5	32
		1,u	2	0	0	2	−2	3	3	2	5	30
7886.7	0.8515	2,g	0	0	2	4	4	2	−2	2	6	44
7887.3	0.8516	0,g^+	0	0	2	4	2	2	−2	2	6	63
7888.1	0.8796	1,u								0	15	<25
7888.6	0.8516	0,g^-	0	0	2	4	−2	2	2	2	6	75
7888.9	0.8798	1,g								0	15	<25
7890.5	0.8800	1,u								0	15	<25
7890.7	0.8638	2,u	1	0	0	1	1	9	1	1	10	29
		2,u	1	0	0	1	−1	9	3	1	10	44
7890.8	0.8516	2,u	0	0	2	3	1	3	1	2	6	40
		2,u	0	0	2	5	1	1	1	2	6	39
7891.7	0.8473	1,u	2	0	0	2	2	3	−1	2	5	40
		1,u	2	0	0	2	−2	3	3	2	5	57
7893.2	0.8797	1,g								0	15	<25
7893.4	0.8799	1,u								0	15	<25
7893.5	0.8702	2,u	0	1	0	7	7	5	−5	1	12	68
7893.6	0.8702	0,g^+	0	1	0	6	6	6	−6	1	12	59
7894.7	0.8636	0,u^-	1	0	0	1	−1	9	1	1	10	29
		0,u^-	1	0	0	3	−1	7	1	1	10	33
7896.8	0.8516	0,u^+	0	0	2	3	3	3	−3	2	6	85
7897.4	0.8516	2,g	0	0	2	4	0	2	2	2	6	64
7898.1	0.8516	0,u^-	0	0	2	3	−3	3	3	2	6	97
7898.6	0.8702	0,u^-	0	1	0	5	−5	7	5	1	12	43

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,u^-$	0	1	0	7	−5	5	5	1	12	27
7901.0	0.8473	$1,u$	2	0	0	2	0	3	1	2	5	53
7901.5	0.8636	$2,u$								1	10	<25
7903.1	0.8794	$1,u$	0	0	0	12	0	3	1	0	15	26
		$1,u$	0	0	0	12	−2	3	3	0	15	39
7904.2	0.8702	$2,g$	0	1	0	6	6	6	−4	1	12	35
7905.0	0.8515	$0,g^+$	0	0	2	6	0	0	0	2	6	65
7905.2	0.8799	$1,g$								0	15	<25
7906.0	0.8492	$1,g$	0	3	0	1	1	4	0	3	5	47
		$1,g$	0	3	0	1	−1	4	2	3	5	48
7907.9	0.8516	$2,u$	0	0	2	3	3	3	−1	2	6	36
		$2,u$	0	0	2	3	−1	3	3	2	6	28
7908.2	0.8516	$0,u^+$	0	0	2	3	1	3	−1	2	6	42
		$0,u^+$	0	0	2	5	1	1	−1	2	6	29
7908.3	0.8515	$2,g$	0	0	2	6	2	0	0	2	6	60
7908.3	0.8702	$0,g^-$	0	1	0	6	−6	6	6	1	12	82
7909.2	0.8638	$0,g^+$	1	0	0	0	0	10	0	1	10	53
7910.5	0.8798	$1,u$								0	15	<25
7912.6	0.8516	$2,u$	0	0	2	3	−1	3	3	2	6	50
7914.7	0.8492	$1,g$	0	3	0	1	1	4	0	3	5	44
		$1,g$	0	3	0	1	−1	4	2	3	5	45
7915.8	0.8329	$0,g^+$	1	3	0	0	0	0	0	4	0	99
7916.0	0.8638	$2,g$	1	0	0	0	0	10	2	1	10	54
7916.6	0.8702	$2,u$								1	12	<25
7920.4	0.8516	$0,u^-$	0	0	2	1	−1	5	1	2	6	30
		$0,u^-$	0	0	2	5	−1	1	1	2	6	53
7921.7	0.8517	$0,g^+$	0	0	2	2	2	4	−2	2	6	59
7922.9	0.8794	$1,u$	0	0	0	12	2	3	−1	0	15	32
		$1,u$	0	0	0	12	−2	3	3	0	15	30
7923.6	0.8703	$0,g^+$								1	12	<25
7925.0	0.8516	$2,u$	0	0	2	5	1	1	1	2	6	38
7925.1	0.8703	$0,u^-$	0	1	0	7	−1	5	1	1	12	28
7925.8	0.8474	$1,g$	2	0	0	1	1	4	0	2	5	48
		$1,g$	2	0	0	1	−1	4	2	2	5	48
7926.0	0.8702	$0,u^+$	0	1	0	5	5	7	−5	1	12	28
		$0,u^+$	0	1	0	7	5	5	−5	1	12	42
7927.6	0.8517	$2,g$	0	0	2	2	−2	4	4	2	6	71
7928.4	0.8517	$0,g^-$	0	0	2	2	−2	4	2	2	6	75
7928.7	0.8794	$1,g$	0	0	0	13	3	2	−2	0	15	44
7929.6	0.8702	$0,g^+$	0	1	0	6	6	6	−6	1	12	26
7930.9	0.8703	$2,g$								1	12	<25
7931.6	0.8794	$1,g$	0	0	0	13	1	2	0	0	15	30
7932.0	0.8703	$2,u$								1	12	<25
7934.0	0.8517	$2,g$	0	0	2	2	2	4	0	2	6	38
7934.3	0.8474	$1,g$	2	0	0	1	1	4	0	2	5	44
		$1,g$	2	0	0	1	−1	4	2	2	5	46
7934.7	0.8702	$2,g$								1	12	<25
7939.6	0.8516	$0,g^+$	0	0	2	4	0	2	0	2	6	28
7941.6	0.8702	$2,u$	0	1	0	5	−5	7	7	1	12	46
7944.4	0.8354	$1,g$	1	0	2	1	1	0	0	3	1	99
7944.8	0.8517	$2,g$								2	6	<25
7945.9	0.8493	$1,u$	0	3	0	0	0	5	1	3	5	93
7946.3	0.8701	$2,g$	0	1	0	6	6	6	−4	1	12	26
		$2,g$	0	1	0	8	6	4	−4	1	12	54
7947.3	0.8455	$0,u^+$	0	2	1	4	0	0	0	3	4	93
7947.9	0.8517	$0,u^+$	0	0	2	1	1	5	−1	2	6	81
7949.8	0.8455	$2,u$	0	2	1	4	2	0	0	3	4	95
7950.3	0.8702	$0,u^+$	0	1	0	5	5	7	−5	1	12	27
7950.5	0.8702	$0,g^-$	0	1	0	8	−4	4	4	1	12	33
7952.0	0.8702	$0,u^-$	0	1	0	7	−5	5	5	1	12	64
7953.9	0.8793	$1,g$	0	0	0	13	3	2	−2	0	15	28
		$1,g$	0	0	0	13	−1	2	2	0	15	55
7954.5	0.8518	$2,u$	0	0	2	1	1	5	1	2	6	30
		$2,u$	0	0	2	1	−1	5	3	2	6	55

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7956.0	0.8702	$2,u$								1	12	<25
7959.0	0.8455	$0,g^+$	0	2	1	3	1	1	−1	3	4	96
7960.1	0.8794	$1,u$	0	0	0	12	0	3	1	0	15	34
7960.5	0.8538	$1,u$	1	1	0	6	2	1	−1	2	7	55
7960.8	0.8455	$2,g$	0	2	1	3	3	1	−1	3	4	83
7960.9	0.8668	$1,g$								1	11	<25
7960.9	0.8668	$1,u$								1	11	<25
7961.2	0.8517	$0,u^-$	0	0	2	1	−1	5	1	2	6	58
		$0,u^-$	0	0	2	3	−1	3	1	2	6	34
7961.6	0.8702	$2,g$	0	1	0	8	4	4	−2	1	12	28
7962.3	0.8702	$0,g^-$	0	1	0	6	−2	6	2	1	12	34
7962.6	0.8538	$1,g$	1	1	0	5	1	2	0	2	7	46
		$1,g$	1	1	0	7	1	0	0	2	7	35
7964.2	0.8702	$0,u^-$	0	1	0	5	−5	7	5	1	12	35
7965.6	0.8702	$0,u^+$	0	1	0	7	3	5	−3	1	12	29
7966.4	0.8701	$0,g^+$	0	1	0	4	4	8	−4	1	12	26
		$0,g^+$	0	1	0	8	4	4	−4	1	12	56
7966.8	0.8517	$2,u$	0	0	2	1	1	5	1	2	6	37
7967.2	0.8475	$1,u$	2	0	0	0	0	5	1	2	5	93
7967.8	0.8539	$1,g$	1	1	0	5	3	2	−2	2	7	69
7970.4	0.8539	$1,u$	1	1	0	4	0	3	1	2	7	27
		$1,u$	1	1	0	6	0	1	1	2	7	39
7970.5	0.8702	$2,g$								1	12	<25
7970.7	0.8455	$0,g^-$	0	2	1	3	−1	1	1	3	4	93
7971.9	0.8702	$2,u$								1	12	<25
7973.7	0.8702	$2,u$								1	12	<25
7974.4	0.8455	$2,g$	0	2	1	3	1	1	1	3	4	78
7975.6	0.8820	$0,u^+$								0	16	<25
7975.6	0.8820	$0,g^-$								0	16	<25
7975.7	0.8518	$0,g^+$	0	0	2	0	0	6	0	2	6	71
7976.6	0.8539	$1,g$	1	1	0	5	−1	2	2	2	7	66
7977.7	0.8540	$1,u$	1	1	0	4	4	3	−3	2	7	95
7980.2	0.8355	$1,u$	1	0	2	0	0	1	1	3	1	99
7980.7	0.8702	$2,g$	0	1	0	4	−4	8	6	1	12	30
7982.2	0.8456	$0,u^+$	0	2	1	2	2	2	−2	3	4	66
		$0,u^+$	0	2	1	2	0	2	0	3	4	31
7982.4	0.8518	$2,g$	0	0	2	0	0	6	2	2	6	74
7983.2	0.8701	$0,g^-$	0	1	0	8	−4	4	4	1	12	45
7983.6	0.8820	$2,u$								0	16	<25
7983.6	0.8820	$2,g$								0	16	<25
7984.5	0.8792	$1,u$	0	0	0	14	2	1	−1	0	15	59
		$1,u$	0	0	0	14	0	1	1	0	15	36
7986.6	0.8539	$1,g$	1	1	0	7	1	0	0	2	7	44
7987.1	0.8700	$2,u$	0	1	0	9	5	3	−3	1	12	40
7987.4	0.8456	$0,u^-$	0	2	1	2	−2	2	2	3	4	100
7987.9	0.8702	$0,u^-$								1	12	<25
7990.6	0.8540	$1,u$	1	1	0	4	−2	3	3	2	7	63
7991.2	0.8701	$0,g^+$	0	1	0	8	2	4	−2	1	12	37
7991.3	0.8456	$2,u$	0	2	1	2	2	2	0	3	4	64
		$2,u$	0	2	1	2	0	2	2	3	4	33
7992.8	0.8793	$1,g$	0	0	0	13	1	2	0	0	15	48
		$1,g$	0	0	0	13	−1	2	2	0	15	27
7994.3	0.8395	$0,g^+$	0	4	0	2	0	0	0	4	2	99
7994.9	0.8701	$0,u^+$	0	1	0	7	1	5	−1	1	12	47
7995.8	0.8702	$2,u$								1	12	<25
7995.9	0.8540	$1,u$	1	1	0	4	2	3	−1	2	7	33
7996.6	0.8395	$2,g$	0	4	0	2	2	0	0	4	2	100
7996.6	0.8456	$0,u^+$	0	2	1	2	2	2	−2	3	4	34
		$0,u^+$	0	2	1	2	0	2	0	3	4	57
7997.9	0.8702	$2,g$								1	12	<25
7998.8	0.8702	$0,g^+$	0	1	0	6	4	6	−4	1	12	32
		$0,g^+$	0	1	0	6	2	6	−2	1	12	25
8001.6	0.8456	$2,u$	0	2	1	2	2	2	0	3	4	31
		$2,u$	0	2	1	2	0	2	2	3	4	63

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8002.1	0.8668	1,g								1	11	<25
8002.3	0.8668	1,u								1	11	<25
8002.4	0.8700	0,u^+	0	1	0	9	3	3	−3	1	12	44
8005.2	0.8702	0,g^+								1	12	<25
8005.4	0.8702	0,g^-	0	1	0	4	−4	8	4	1	12	35
		0,g^-	0	1	0	6	−4	6	4	1	12	26
8005.7	0.8702	0,u^-	0	1	0	9	−1	3	1	1	12	27
8005.9	0.8701	2,g								1	12	<25
8007.2	0.8701	2,u	0	1	0	7	−1	5	3	1	12	30
8007.7	0.8539	1,u	1	1	0	6	0	1	1	2	7	31
8009.6	0.8702	2,g								1	12	<25
8010.6	0.8540	1,g	1	1	0	3	−3	4	4	2	7	89
8011.5	0.8702	2,u								1	12	<25
8013.4	0.8701	0,u^-	0	1	0	9	−3	3	3	1	12	51
8013.5	0.8540	1,g	1	1	0	3	3	4	−2	2	7	68
8014.0	0.8701	2,g								1	12	<25
8015.1	0.8702	0,u^+	0	1	0	5	3	7	−3	1	12	25
		0,u^+	0	1	0	9	1	3	−1	1	12	40
8015.3	0.8701	0,g^+								1	12	<25
8016.1	0.8457	0,g^+	0	2	1	1	1	3	−1	3	4	96
8018.1	0.8701	2,g								1	12	<25
8019.1	0.8702	0,g^-	0	1	0	2	−2	10	2	1	12	30
8019.6	0.8701	2,u								1	12	<25
8021.6	0.8702	0,u^+	0	1	0	5	1	7	−1	1	12	48
8022.1	0.8702	2,u								1	12	<25
8022.5	0.8540	1,g	1	1	0	3	−1	4	2	2	7	38
8023.2	0.8667	1,g	0	0	1	6	6	5	−5	1	11	64
8024.1	0.8457	2,g	0	2	1	1	1	3	1	3	4	50
		2,g	0	2	1	1	−1	3	3	3	4	48
8025.4	0.8457	0,g^-	0	2	1	1	−1	3	1	3	4	93
8025.8	0.8792	1,u	0	0	0	14	2	1	−1	0	15	36
		1,u	0	0	0	14	0	1	1	0	15	59
8027.1	0.8700	0,g^+	0	1	0	10	2	2	−2	1	12	38
8027.7	0.8702	2,g								1	12	<25
8027.8	0.8667	1,u	0	0	1	5	5	6	−4	1	11	28
8028.3	0.8396	0,u^+	0	4	0	1	1	1	−1	4	2	100
8028.8	0.8702	2,u								1	12	<25
8030.1	0.8701	2,g								1	12	<25
8031.7	0.8457	2,g	0	2	1	1	1	3	1	3	4	44
		2,g	0	2	1	1	−1	3	3	3	4	52
8032.4	0.8540	1,g	1	1	0	5	1	2	0	2	7	25
8035.3	0.8820	0,g^+								0	16	<25
8035.5	0.8396	0,u^-	0	4	0	1	−1	1	1	4	2	100
8035.7	0.8820	0,u^-								0	16	<25
8038.6	0.8396	2,u	0	4	0	1	1	1	1	4	2	100
8039.9	0.8703	0,g^+	0	1	0	4	2	8	−2	1	12	33
8040.0	0.8667	1,g								1	11	<25
8040.6	0.8703	0,u^-	0	1	0	3	−3	9	3	1	12	32
		0,u^-	0	1	0	5	−3	7	3	1	12	28
8043.3	0.8820	2,u								0	16	<25
8043.7	0.8820	2,g								0	16	<25
8043.8	0.8311	0,g^+	3	0	0	0	0	0	0	3	0	100
8045.4	0.8667	1,u	0	0	1	5	−5	6	6	1	11	52
8046.3	0.8703	2,g								1	12	<25
8046.8	0.8541	1,u	1	1	0	2	0	5	1	2	7	27
		1,u	1	1	0	2	−2	5	3	2	7	45
8047.6	0.8703	2,u								1	12	<25
8049.0	0.8701	0,u^+	0	1	0	11	1	1	−1	1	12	36
8050.4	0.8700	0,g^-	0	1	0	10	−2	2	2	1	12	62
8050.9	0.8541	1,u	1	1	0	2	2	5	−1	2	7	46
		1,u	1	1	0	2	−2	5	3	2	7	33
8052.3	0.8700	2,u	0	1	0	11	3	1	−1	1	12	46
8053.5	0.8458	0,u^+	0	2	1	0	0	4	0	3	4	94
8055.3	0.8791	1,g	0	0	0	15	1	0	0	0	15	98

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8055.3	0.8701	$2,g$								1	12	<25
8057.0	0.8668	$1,u$								1	11	<25
8057.1	0.8703	$0,u^+$	0	1	0	3	1	9	−1	1	12	33
8057.3	0.8668	$1,g$								1	11	<25
8060.1	0.8702	$0,g^+$								1	12	<25
8060.6	0.8541	$1,u$	1	1	0	2	0	5	1	2	7	30
8060.7	0.8702	$0,u^-$	0	1	0	9	−1	3	1	1	12	26
8061.0	0.8819	$0,g^+$								0	16	<25
8061.1	0.8458	$2,u$	0	2	1	0	0	4	2	3	4	96
8062.8	0.8819	$0,u^-$								0	16	<25
8062.9	0.8703	$2,u$								1	12	<25
8064.1	0.8667	$1,g$								1	11	<25
8064.3	0.8700	$0,u^+$	0	1	0	11	1	1	−1	1	12	36
8065.1	0.8667	$1,u$								1	11	<25
8066.5	0.8701	$2,u$	0	1	0	11	1	1	1	1	12	25
8066.5	0.8702	$2,g$	0	1	0	10	0	2	2	1	12	27
8067.8	0.8819	$2,u$								0	16	<25
8070.0	0.8819	$2,g$								0	16	<25
8070.1	0.8702	$2,u$								1	12	<25
8071.8	0.8377	$0,g^+$	2	1	0	2	0	0	0	3	2	99
8072.8	0.8667	$1,u$	0	0	1	5	5	6	−4	1	11	30
		$1,u$	0	0	1	7	5	4	−4	1	11	40
8074.1	0.8377	$2,g$	2	1	0	2	2	0	0	3	2	99
8074.8	0.8703	$0,g^-$	0	1	0	4	−2	8	2	1	12	28
8075.1	0.8397	$0,g^+$	0	4	0	0	0	2	0	4	2	99
8075.5	0.8705	$0,g^+$	0	1	0	2	2	10	−2	1	12	44
8077.5	0.8667	$1,g$								1	11	<25
8078.8	0.8703	$2,g$	0	1	0	2	−2	10	4	1	12	28
8079.9	0.8504	$0,g^+$	1	0	1	5	1	1	−1	2	6	83
8080.6	0.8504	$0,u^+$	1	0	1	4	0	2	0	2	6	38
		$0,u^+$	1	0	1	6	0	0	0	2	6	55
8080.9	0.8667	$1,u$								1	11	<25
8081.2	0.8504	$2,g$	1	0	1	5	3	1	−1	2	6	71
8082.3	0.8542	$1,g$	1	1	0	1	1	6	0	2	7	40
		$1,g$	1	1	0	1	−1	6	2	2	7	48
8083.2	0.8397	$2,g$	0	4	0	0	0	2	2	4	2	100
8083.3	0.8504	$2,u$	1	0	1	4	2	2	0	2	6	35
		$2,u$	1	0	1	6	2	0	0	2	6	53
8084.1	0.8420	$1,g$	0	1	2	3	1	0	0	3	3	96
8085.1	0.8704	$2,g$	0	1	0	2	2	10	0	1	12	34
8085.4	0.8667	$1,g$	0	0	1	6	−4	5	5	1	11	30
8088.9	0.8504	$2,u$	1	0	1	4	4	2	−2	2	6	85
8089.1	0.8819	$0,g^-$	0	0	0	8	−8	8	8	0	16	61
8090.5	0.8541	$1,g$	1	1	0	1	1	6	0	2	7	37
		$1,g$	1	1	0	1	−1	6	2	2	7	31
8090.6	0.8504	$0,g^-$	1	0	1	3	−1	3	1	2	6	33
		$0,g^-$	1	0	1	5	−1	1	1	2	6	62
8091.7	0.8504	$0,u^+$	1	0	1	4	2	2	−2	2	6	71
8092.5	0.8701	$0,g^+$	0	1	0	0	0	12	0	1	12	25
8093.5	0.8667	$1,u$	0	0	1	7	−1	4	2	1	11	27
8093.7	0.8667	$1,g$	0	0	1	6	−2	5	3	1	11	25
8095.0	0.8700	$0,u^-$	0	1	0	11	−1	1	1	1	12	58
8095.3	0.8504	$2,g$	1	0	1	3	1	3	1	2	6	25
		$2,g$	1	0	1	5	1	1	1	2	6	56
8095.4	0.8705	$0,u^+$	0	1	0	1	1	11	−1	1	12	57
8095.6	0.8667	$1,g$								1	11	<25
8095.6	0.8667	$1,u$								1	11	<25
8095.6	0.8505	$0,u^-$	1	0	1	4	−2	2	2	2	6	85
8095.7	0.8818	$2,u$	0	0	0	9	9	7	−7	0	16	45
8097.6	0.8701	$2,g$	0	1	0	12	2	0	0	1	12	33
8099.1	0.8421	$1,u$	0	1	2	2	2	1	−1	3	3	70
		$1,u$	0	1	2	2	0	1	1	3	3	29
8099.4	0.8701	$2,u$	0	1	0	11	1	1	1	1	12	34
8102.0	0.8819	$0,u^+$	0	0	0	7	7	9	−7	0	16	36

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8102.6	0.8704	2,*u*	0	1	0	1	1	11	1	1	12	34
8102.9	0.8504	2,*u*	1	0	1	4	0	2	2	2	6	51
8107.3	0.8699	$0,g^+$	0	1	0	12	0	0	0	1	12	68
8107.3	0.8378	$0,u^+$	2	1	0	1	1	1	−1	3	2	99
8107.5	0.8505	$0,u^+$	1	0	1	4	0	2	0	2	6	31
		$0,u^+$	1	0	1	6	0	0	0	2	6	29
8107.8	0.8505	$0,g^+$	1	0	1	3	3	3	−3	2	6	79
8108.9	0.8667	1,*g*								1	11	<25
8109.1	0.8421	1,*u*	0	1	2	2	2	1	−1	3	3	30
		1,*u*	0	1	2	2	0	1	1	3	3	67
8109.4	0.8505	$0,g^-$	1	0	1	3	−3	3	3	2	6	97
8109.9	0.8819	2,*g*								0	16	<25
8110.7	0.8699	2,*g*	0	1	0	12	2	0	0	1	12	60
8111.2	0.8667	1,*u*								1	11	<25
8111.8	0.8505	2,*u*	1	0	1	4	0	2	2	2	6	27
8114.5	0.8378	$0,u^-$	2	1	0	1	−1	1	1	3	2	99
8116.2	0.8701	$0,u^-$								1	12	<25
8117.2	0.8542	1,*u*	1	1	0	0	0	7	1	2	7	83
8117.3	0.8667	1,*g*								1	11	<25
8117.6	0.8505	2,*g*	1	0	1	3	3	3	−1	2	6	59
8117.6	0.8378	2,*u*	2	1	0	1	1	1	1	3	2	99
8118.4	0.8819	$0,g^+$	0	0	0	8	8	8	−8	0	16	69
8118.4	0.8505	$0,g^+$	1	0	1	3	1	3	−1	2	6	55
8119.5	0.8702	$0,g^+$								1	12	<25
8122.0	0.8666	1,*u*	0	0	1	9	3	2	−2	1	11	43
8122.2	0.8607	1,*g*								2	9	<25
8122.2	0.8607	1,*u*								2	9	<25
8122.5	0.8701	2,*u*								1	12	<25
8124.4	0.8505	2,*g*	1	0	1	3	−1	3	3	2	6	68
8124.9	0.8819	2,*u*	0	0	0	9	9	7	−7	0	16	27
8126.0	0.8703	2,*g*								1	12	<25
8126.1	0.8667	1,*g*								1	11	<25
8126.3	0.8667	1,*u*	0	0	1	9	1	2	0	1	11	26
8127.9	0.8422	1,*g*	0	1	2	1	1	2	0	3	3	50
		1,*g*	0	1	2	1	−1	2	2	3	3	48
8128.5	0.8819	$0,g^-$								0	16	<25
8129.2	0.8667	1,*u*								1	11	<25
8129.4	0.8505	$0,g^-$	1	0	1	3	−1	3	1	2	6	39
		$0,g^-$	1	0	1	5	−1	1	1	2	6	35
8130.0	0.8667	1,*g*								1	11	<25
8131.5	0.8667	1,*g*	0	0	1	8	−2	3	3	1	11	37
8134.3	0.8505	2,*g*	1	0	1	3	1	3	1	2	6	32
8135.9	0.8819	$0,u^+$	0	0	0	7	7	9	−7	0	16	25
8136.0	0.8607	1,*g*	0	2	0	5	5	4	−4	2	9	44
8136.0	0.8422	1,*g*	0	1	2	1	1	2	0	3	3	46
		1,*g*	0	1	2	1	−1	2	2	3	3	51
8136.8	0.8607	1,*u*	0	2	0	6	4	3	−3	2	9	37
8137.0	0.8667	1,*u*								1	11	<25
8138.4	0.8506	$0,u^+$	1	0	1	2	2	4	−2	2	6	62
		$0,u^+$	1	0	1	2	0	4	0	2	6	29
8139.9	0.8819	2,*u*	0	0	0	7	−7	9	9	0	16	28
8142.0	0.8819	2,*g*								0	16	<25
8142.2	0.8668	1,*u*								1	11	<25
8143.6	0.8607	1,*g*	0	2	0	5	5	4	−4	2	9	44
8144.0	0.8506	$0,u^-$	1	0	1	2	−2	4	2	2	6	85
8145.5	0.8506	2,*u*	1	0	1	2	−2	4	4	2	6	57
8145.8	0.8606	1,*u*	0	2	0	6	2	3	−1	2	9	28
8149.2	0.8606	1,*g*								2	9	<25
8150.2	0.8506	2,*u*	1	0	1	2	2	4	0	2	6	44
		2,*u*	1	0	1	2	−2	4	4	2	6	36
8153.4	0.8819	$0,u^-$	0	0	0	9	−7	7	7	0	16	38
8154.3	0.8506	$0,u^+$	1	0	1	2	0	4	0	2	6	32
8155.3	0.8606	1,*u*	0	2	0	6	0	3	1	2	9	26
		1,*u*	0	2	0	6	−2	3	3	2	9	26

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8155.5	0.8379	$0,g^+$	2	1	0	0	0	2	0	3	2	98
8155.8	0.8665	$1,g$	0	0	1	10	2	1	−1	1	11	44
		$1,g$	0	0	1	10	0	1	1	1	11	26
8158.9	0.8361	$1,u$	0	3	1	1	1	0	0	4	1	100
8159.8	0.8666	$1,u$								1	11	<25
8159.9	0.8506	$2,u$	1	0	1	2	0	4	2	2	6	35
8160.2	0.8669	$1,g$								1	11	<25
8161.9	0.8819	$2,g$								0	16	<25
8162.2	0.8422	$1,u$	0	1	2	0	0	3	1	3	3	96
8163.7	0.8379	$2,g$	2	1	0	0	0	2	2	3	2	99
8165.2	0.8607	$1,g$	0	2	0	5	−3	4	4	2	9	52
8166.7	0.8444	$0,g^+$	1	2	0	4	0	0	0	3	4	96
8167.9	0.8819	$0,g^-$	0	0	0	6	−6	10	6	0	16	48
8168.3	0.8657	$1,u$								1	11	<25
8168.3	0.8657	$1,g$								1	11	<25
8168.7	0.8819	$0,g^+$								0	16	<25
8169.0	0.8444	$2,g$	1	2	0	4	2	0	0	3	4	97
8169.7	0.8668	$1,g$	0	0	1	0	0	11	1	1	11	31
8171.0	0.8507	$0,g^+$	1	0	1	1	1	5	−1	2	6	89
8171.3	0.8605	$1,u$	0	2	0	8	2	1	−1	2	9	48
8172.0	0.8667	$1,g$								1	11	<25
8172.9	0.8607	$1,u$	0	2	0	4	−4	5	5	2	9	76
8173.2	0.8667	$1,u$								1	11	<25
8174.3	0.8819	$2,u$								0	16	<25
8174.4	0.8606	$1,g$	0	2	0	7	3	2	−2	2	9	41
8175.5	0.8819	$0,u^-$	0	0	0	7	−7	9	7	0	16	50
8178.1	0.8507	$2,g$	1	0	1	1	1	5	1	2	6	37
		$2,g$	1	0	1	1	−1	5	3	2	6	54
8178.5	0.8819	$2,u$								0	16	<25
8178.9	0.8606	$1,g$	0	2	0	7	1	2	0	2	9	33
8180.4	0.8606	$1,u$	0	2	0	8	0	1	1	2	9	35
8181.0	0.8818	$2,g$	0	0	0	10	8	6	−6	0	16	26
8181.1	0.8506	$0,g^-$	1	0	1	1	−1	5	1	2	6	72
8181.5	0.8818	$0,u^+$	0	0	0	9	7	7	−7	0	16	71
8181.7	0.8607	$1,u$	0	2	0	4	4	5	−3	2	9	45
8182.3	0.8669	$1,u$								1	11	<25
8183.4	0.8606	$1,g$	0	2	0	7	−1	2	2	2	9	52
8185.0	0.8444	$0,u^+$	1	2	0	3	1	1	−1	3	4	97
8186.5	0.8444	$2,u$	1	2	0	3	3	1	−1	3	4	83
8187.4	0.8506	$2,g$	1	0	1	1	1	5	1	2	6	42
		$2,g$	1	0	1	1	−1	5	3	2	6	33
8188.2	0.8819	$0,u^-$	0	0	0	9	−7	7	7	0	16	26
8188.5	0.8819	$2,g$	0	0	0	10	8	6	−6	0	16	31
8194.8	0.8667	$1,g$	0	0	1	10	0	1	1	1	11	28
8196.4	0.8819	$0,g^+$								0	16	<25
8197.2	0.8607	$1,u$	0	2	0	4	−2	5	3	2	9	28
8197.2	0.8444	$0,u^-$	1	2	0	3	−1	1	1	3	4	95
8199.9	0.8362	$1,g$	0	3	1	0	0	1	1	4	1	100
8200.3	0.8664	$1,u$	0	0	1	11	1	0	0	1	11	69
8200.4	0.8819	$2,g$	0	0	0	8	−6	8	8	0	16	30
8200.8	0.8444	$2,u$	1	2	0	3	1	1	1	3	4	80
8201.8	0.8605	$1,g$	0	2	0	9	1	0	0	2	9	69
8201.8	0.8607	$1,u$								2	9	<25
8202.2	0.8819	$2,u$								0	16	<25
8203.8	0.8656	$1,u$								1	11	<25
8204.4	0.8507	$0,u^+$	1	0	1	0	0	6	0	2	6	84
8204.5	0.8656	$1,g$								1	11	<25
8208.9	0.8343	$1,u$	2	0	1	1	1	0	0	3	1	99
8211.5	0.8507	$2,u$	1	0	1	0	0	6	2	2	6	85
8211.7	0.8608	$1,g$	0	2	0	3	−3	6	4	2	9	64
8211.7	0.8819	$0,g^-$	0	0	0	8	−6	8	6	0	16	29
8214.6	0.8666	$1,u$								1	11	<25
8214.6	0.8445	$0,g^+$	1	2	0	2	2	2	−2	3	4	65
		$0,g^+$	1	2	0	2	0	2	0	3	4	33

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8215.1	0.8666	1,g								1	11	<25
8216.9	0.8608	1,g	0	2	0	3	3	6	−2	2	9	52
8217.1	0.8606	1,u	0	2	0	8	0	1	1	2	9	31
8217.5	0.8819	0,u^-								0	16	<25
8219.4	0.8386	0,u^+	0	0	3	2	0	0	0	3	2	97
8220.0	0.8445	0,g^-	1	2	0	2	−2	2	2	3	4	100
8220.2	0.8819	2,u								0	16	<25
8220.3	0.8656	1,u	1	0	0	6	6	5	−5	1	11	62
8222.1	0.8386	2,u	0	0	3	2	2	0	0	3	2	99
8223.6	0.8445	2,g	1	2	0	2	2	2	0	3	4	68
		2,g	1	2	0	2	0	2	2	3	4	30
8224.5	0.8819	2,g								0	16	<25
8226.4	0.8608	1,g								2	9	<25
8227.1	0.8656	1,g								1	11	<25
8229.3	0.8445	0,g^+	1	2	0	2	2	2	−2	3	4	35
		0,g^+	1	2	0	2	0	2	0	3	4	59
8234.4	0.8445	2,g	1	2	0	2	2	2	0	3	4	28
		2,g	1	2	0	2	0	2	2	3	4	67
8234.4	0.8819	0,u^+								0	16	<25
8235.6	0.8819	0,g^+	0	0	0	6	6	10	−6	0	16	34
8237.7	0.8607	1,g								2	9	<25
8237.7	0.8386	0,g^+	0	0	3	1	1	1	−1	3	2	99
8239.0	0.8656	1,u								1	11	<25
8242.7	0.8819	2,u								0	16	<25
8243.6	0.8819	0,u^+								0	16	<25
8244.3	0.8818	0,g^-	0	0	0	8	−6	8	6	0	16	29
		0,g^-	0	0	0	10	−6	6	6	0	16	26
8244.6	0.8656	1,g	1	0	0	5	−5	6	6	1	11	48
8244.7	0.8819	2,g								0	16	<25
8244.9	0.8386	0,g^-	0	0	3	1	−1	1	1	3	2	99
8247.5	0.8609	1,u	0	2	0	2	−2	7	3	2	9	54
8248.0	0.8386	2,g	0	0	3	1	1	1	1	3	2	99
8249.5	0.8817	0,g^+	0	0	0	10	6	6	−6	0	16	58
8250.5	0.8608	1,u	0	2	0	2	2	7	−1	2	9	49
8250.7	0.8819	2,g								0	16	<25
8251.0	0.8817	2,u	0	0	0	11	7	5	−5	0	16	39
8251.3	0.8344	1,g	2	0	1	0	0	1	1	3	1	99
8255.2	0.8446	0,u^+	1	2	0	1	1	3	−1	3	4	97
8255.3	0.8572	0,u^+	0	1	1	4	0	4	0	2	8	26
8255.4	0.8572	0,g^-	0	1	1	3	−1	5	1	2	8	38
		0,g^-	0	1	1	5	−1	3	1	2	8	33
8259.0	0.8818	2,u	0	0	0	9	−5	7	7	0	16	28
8259.0	0.8656	1,g								1	11	<25
8259.1	0.8656	1,u								1	11	<25
8259.6	0.8572	2,g	0	1	1	5	5	3	−3	2	8	29
8259.6	0.8572	2,u	0	1	1	4	4	4	−2	2	8	26
		2,u	0	1	1	6	4	2	−2	2	8	26
8261.2	0.8656	1,u								1	11	<25
8261.3	0.8656	1,g	1	0	0	7	5	4	−4	1	11	29
8261.4	0.8608	1,u								2	9	<25
8262.4	0.8818	0,g^-	0	0	0	10	−6	6	6	0	16	40
8262.6	0.8572	2,g	0	1	1	5	5	3	−3	2	8	68
8263.3	0.8446	2,u	1	2	0	1	1	3	1	3	4	55
		2,u	1	2	0	1	−1	3	3	3	4	43
8264.0	0.8446	0,u^-	1	2	0	1	−1	3	1	3	4	95
8264.6	0.8571	2,u	0	1	1	6	4	2	−2	2	8	32
8264.8	0.8572	0,g^+	0	1	1	5	1	3	−1	2	8	30
8265.6	0.8572	0,u^-	0	1	1	4	−2	4	2	2	8	41
		0,u^-	0	1	1	6	−2	2	2	2	8	36
8266.1	0.8818	0,u^-	0	0	0	9	−5	7	5	0	16	32
8266.6	0.8819	0,g^+	0	0	0	8	6	8	−6	0	16	30
		0,g^+	0	0	0	8	4	8	−4	0	16	25
8267.8	0.8571	0,u^+	0	1	1	6	2	2	−2	2	8	34
		0,u^+	0	1	1	6	0	2	0	2	8	28

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8268.5	0.8656	1,g	1	0	0	5	5	6	−4	1	11	30
8268.8	0.8387	0,u^+	0	0	3	0	0	2	0	3	2	97
8269.5	0.8571	2,g								2	8	<25
8270.7	0.8818	2,u	0	0	0	11	7	5	−5	0	16	26
8270.7	0.8446	2,u	1	2	0	1	1	3	1	3	4	41
		2,u	1	2	0	1	−1	3	3	3	4	57
8271.1	0.8819	0,u^+	0	0	0	7	5	9	−5	0	16	34
8271.8	0.8818	2,g								0	16	<25
8272.3	0.8572	0,g^-	0	1	1	5	−3	3	3	2	8	64
8272.4	0.8572	0,g^+	0	1	1	5	3	3	−3	2	8	50
		0,g^+	0	1	1	5	1	3	−1	2	8	29
8272.8	0.8656	1,u	1	0	0	8	4	3	−3	1	11	35
8276.1	0.8572	2,u	0	1	1	6	0	2	2	2	8	30
8276.5	0.8387	2,u	0	0	3	0	0	2	2	3	2	99
8277.0	0.8656	1,g	1	0	0	7	−3	4	4	1	11	34
8278.1	0.8609	1,g	0	2	0	1	1	8	0	2	9	34
		1,g	0	2	0	1	−1	8	2	2	9	44
8278.1	0.8819	2,u	0	0	0	7	−5	9	7	0	16	27
8278.6	0.8819	2,g								0	16	<25
8279.1	0.8572	0,u^+	0	1	1	4	4	4	−4	2	8	86
8279.2	0.8572	0,u^-	0	1	1	4	−4	4	4	2	8	87
8280.5	0.8656	1,u								1	11	<25
8283.5	0.8725	1,u								1	13	<25
8283.5	0.8725	1,g								1	13	<25
8285.8	0.8655	1,u	1	0	0	8	0	3	1	1	11	26
8286.0	0.8655	1,g	1	0	0	7	−1	4	2	1	11	35
8286.3	0.8572	2,g	0	1	1	5	−1	3	3	2	8	48
8287.1	0.8608	1,g	0	2	0	1	1	8	0	2	9	26
8288.7	0.8819	0,g^+								0	16	<25
8288.9	0.8655	1,g								1	11	<25
8290.1	0.8656	1,u								1	11	<25
8292.7	0.8571	0,g^+	0	1	1	7	1	1	−1	2	8	67
8293.8	0.8571	2,g	0	1	1	7	3	1	−1	2	8	53
8295.4	0.8572	2,u	0	1	1	4	4	4	−2	2	8	54
		2,u	0	1	1	6	4	2	−2	2	8	29
8296.4	0.8819	2,u								0	16	<25
8296.4	0.8818	0,u^+	0	0	0	9	5	7	−5	0	16	34
8297.8	0.8842	1,g								0	17	<25
8297.8	0.8842	1,u								0	17	<25
8298.2	0.8819	0,u^-								0	16	<25
8298.3	0.8409	1,u	1	1	1	3	1	0	0	3	3	97
8298.5	0.8572	0,u^+								2	8	<25
8299.3	0.8447	0,g^+	1	2	0	0	0	4	0	3	4	96
8299.7	0.8572	2,u	0	1	1	4	−2	4	4	2	8	66
8300.0	0.8818	2,g								0	16	<25
8301.1	0.8571	0,u^+	0	1	1	6	2	2	−2	2	8	32
		0,u^+	0	1	1	8	0	0	0	2	8	36
8303.1	0.8571	2,u	0	1	1	8	2	0	0	2	8	51
8303.6	0.8571	0,g^-	0	1	1	7	−1	1	1	2	8	57
8304.7	0.8655	1,g								1	11	<25
8304.7	0.8572	0,u^-	0	1	1	2	−2	6	2	2	8	29
		0,u^-	0	1	1	6	−2	2	2	2	8	56
8306.1	0.8610	1,u	0	2	0	0	0	9	1	2	9	65
8306.5	0.8656	1,u								1	11	<25
8306.9	0.8447	2,g	1	2	0	0	0	4	2	3	4	97
8308.6	0.8571	2,g	0	1	1	7	1	1	1	2	8	49
8310.3	0.8819	2,g								0	16	<25
8310.9	0.8819	0,g^+								0	16	<25
8312.0	0.8656	1,g								1	11	<25
8312.1	0.8656	1,u								1	11	<25
8312.5	0.8572	2,u	0	1	1	6	0	2	2	2	8	41
8312.9	0.8573	0,g^+	0	1	1	3	3	5	−3	2	8	56
		0,g^+	0	1	1	3	1	5	−1	2	8	26
8313.1	0.8816	0,u^+	0	0	0	11	5	5	−5	0	16	70

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8313.4	0.8573	2,g	0	1	1	3	−3	5	5	2	8	88
8313.4	0.8816	0,u^-	0	0	0	11	−5	5	5	0	16	68
8313.7	0.8573	0,g^-	0	1	1	3	−3	5	3	2	8	67
8313.8	0.8326	0,g^+	0	2	2	0	0	0	0	4	0	99
8314.7	0.8818	2,u								0	16	<25
8316.4	0.8492	0,g^+	2	0	0	6	0	0	0	2	6	82
8317.3	0.8818	2,g	0	0	0	8	−4	8	6	0	16	25
		2,g	0	0	0	10	−4	6	6	0	16	36
8318.1	0.8655	1,u	1	0	0	10	2	1	−1	1	11	35
8318.7	0.8655	1,g								1	11	<25
8318.8	0.8492	2,g	2	0	0	6	2	0	0	2	6	83
8318.8	0.8818	0,g^-	0	0	0	8	−4	8	4	0	16	31
		0,g^-	0	0	0	10	−4	6	4	0	16	31
8319.8	0.8410	1,g	1	1	1	2	2	1	−1	3	3	71
		1,g	1	1	1	2	0	1	1	3	3	29
8320.0	0.8493	0,u^+	2	0	0	5	1	1	−1	2	6	90
8320.9	0.8493	2,u	2	0	0	5	3	1	−1	2	6	75
8321.5	0.8571	0,u^+	0	1	1	8	0	0	0	2	8	45
8323.3	0.8656	1,g								1	11	<25
8323.4	0.8510	0,g^+	0	3	0	6	0	0	0	3	6	78
8323.5	0.8656	1,u								1	11	<25
8324.3	0.8573	2,g	0	1	1	3	3	5	−1	2	8	41
8325.4	0.8571	2,u	0	1	1	8	2	0	0	2	8	36
8325.8	0.8511	0,u^+	0	3	0	5	1	1	−1	3	6	89
8325.9	0.8510	2,g	0	3	0	6	2	0	0	3	6	80
8325.9	0.8572	0,g^+	0	1	1	3	1	5	−1	2	8	25
		0,g^+	0	1	1	5	1	3	−1	2	8	30
8326.8	0.8511	2,u	0	3	0	5	3	1	−1	3	6	74
8327.3	0.8816	2,g	0	0	0	12	6	4	−4	0	16	55
8327.4	0.8820	0,u^-	0	0	0	5	−5	11	5	0	16	30
8327.6	0.8818	2,u	0	0	0	11	5	5	−3	0	16	39
8327.6	0.8820	0,g^-	0	0	0	4	−4	12	4	0	16	26
8329.2	0.8818	0,g^+	0	0	0	10	4	6	−4	0	16	37
8330.1	0.8410	1,g	1	1	1	2	2	1	−1	3	3	29
		1,g	1	1	1	2	0	1	1	3	3	69
8331.0	0.8573	2,g	0	1	1	5	−1	3	3	2	8	29
8333.3	0.8494	2,g	2	0	0	4	4	2	−2	2	6	90
8333.4	0.8493	0,u^-	2	0	0	5	−1	1	1	2	6	77
8334.3	0.8657	1,u								1	11	<25
8334.8	0.8819	2,u								0	16	<25
8335.2	0.8820	2,g								0	16	<25
8336.2	0.8655	1,u								1	11	<25
8336.5	0.8494	0,g^+	2	0	0	4	2	2	−2	2	6	67
8336.9	0.8820	0,u^-	0	0	0	7	−3	9	3	0	16	33
8337.5	0.8493	2,u	2	0	0	5	1	1	1	2	6	65
8337.8	0.8819	2,u								0	16	<25
8338.0	0.8511	2,g	0	3	0	4	4	2	−2	3	6	91
8338.7	0.8511	0,u^-	0	3	0	5	−1	1	1	3	6	75
8339.5	0.8572	0,g^-	0	1	1	1	−1	7	1	2	8	31
		0,g^-	0	1	1	5	−1	3	1	2	8	32
		0,g^-	0	1	1	7	−1	1	1	2	8	34
8340.8	0.8657	1,g	1	0	0	3	−3	8	4	1	11	31
8340.9	0.8819	0,g^-	0	0	0	8	−2	8	2	0	16	27
8341.1	0.8818	0,u^+	0	0	0	11	3	5	−3	0	16	30
8341.1	0.8511	0,g^+	0	3	0	4	2	2	−2	3	6	68
8341.9	0.8573	0,u^+	0	1	1	2	2	6	−2	2	8	52
		0,u^+	0	1	1	2	0	6	0	2	8	28
8342.4	0.8494	0,g^-	2	0	0	4	−2	2	2	2	6	91
8342.9	0.8511	2,u	0	3	0	5	1	1	1	3	6	64
8343.9	0.8818	2,g	0	0	0	8	4	8	−2	0	16	28
8344.4	0.8572	2,g								2	8	<25
8345.8	0.8818	0,u^-	0	0	0	9	−3	7	3	0	16	45
8346.1	0.8724	1,g								1	13	<25
8346.2	0.8724	1,u								1	13	<25

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8346.6	0.8820	$0,g^-$								0	16	<25
8346.8	0.8511	$0,g^-$	0	3	0	4	−2	2	2	3	6	90
8347.2	0.8574	$2,u$	0	1	1	2	−2	6	4	2	8	57
8347.4	0.8573	$0,u^-$	0	1	1	2	−2	6	2	2	8	59
		$0,u^-$	0	1	1	4	−2	4	2	2	8	33
8348.0	0.8819	$2,u$								0	16	<25
8348.2	0.8494	$2,g$	2	0	0	4	2	2	0	2	6	39
		$2,g$	2	0	0	4	0	2	2	2	6	40
8349.0	0.8657	$1,g$								1	11	<25
8349.0	0.8819	$2,g$								0	16	<25
8352.8	0.8511	$2,g$	0	3	0	4	2	2	0	3	6	36
		$2,g$	0	3	0	4	0	2	2	3	6	41
8353.8	0.8494	$0,g^+$	2	0	0	4	0	2	0	2	6	44
8354.2	0.8573	$2,u$	0	1	1	2	2	6	0	2	8	40
8354.9	0.8818	$2,g$								0	16	<25
8355.2	0.8411	$1,u$	1	1	1	1	1	2	0	3	3	53
		$1,u$	1	1	1	1	−1	2	2	3	3	45
8356.2	0.8817	$2,u$								0	16	<25
8356.6	0.8817	$0,u^+$								0	16	<25
8356.8	0.8817	$0,g^-$	0	0	0	10	−2	6	2	0	16	49
8357.3	0.8653	$1,g$	1	0	0	11	1	0	0	1	11	69
8357.4	0.8818	$2,u$								0	16	<25
8358.1	0.8511	$0,g^+$	0	3	0	4	0	2	0	3	6	42
8358.4	0.8817	$0,g^+$	0	0	0	12	4	4	−4	0	16	25
8358.9	0.8494	$2,g$	2	0	0	4	2	2	0	2	6	26
		$2,g$	2	0	0	4	0	2	2	2	6	45
8358.9	0.8657	$1,g$								1	11	<25
8359.7	0.8494	$0,u^+$	2	0	0	3	3	3	−3	2	6	75
8360.1	0.8573	$0,u^+$	0	1	1	0	0	8	0	2	8	26
8360.7	0.8655	$1,u$	1	0	0	10	0	1	1	1	11	38
8361.4	0.8494	$0,u^-$	2	0	0	3	−3	3	3	2	6	95
8362.8	0.8512	$0,u^+$	0	3	0	3	3	3	−3	3	6	76
8362.9	0.8819	$0,u^-$								0	16	<25
8363.1	0.8511	$2,g$	0	3	0	4	2	2	0	3	6	26
		$2,g$	0	3	0	4	0	2	2	3	6	43
8363.2	0.8411	$1,u$	1	1	1	1	1	2	0	3	3	44
		$1,u$	1	1	1	1	−1	2	2	3	3	54
8364.5	0.8512	$0,u^-$	0	3	0	3	−3	3	3	3	6	96
8365.1	0.8818	$2,g$								0	16	<25
8365.7	0.8573	$2,u$	0	1	1	0	0	8	2	2	8	26
8368.6	0.8494	$2,u$	2	0	0	3	3	3	−1	2	6	68
8370.1	0.8494	$0,u^+$	2	0	0	3	1	3	−1	2	6	61
8370.1	0.8574	$0,g^+$	0	1	1	1	1	7	−1	2	8	76
8371.6	0.8817	$2,g$								0	16	<25
8371.9	0.8512	$2,u$	0	3	0	3	3	3	−1	3	6	66
8373.2	0.8512	$0,u^+$	0	3	0	3	1	3	−1	3	6	60
8374.7	0.8816	$2,u$	0	0	0	11	−3	5	5	0	16	41
8375.1	0.8658	$1,u$	1	0	0	2	−2	9	3	1	11	36
8375.3	0.8819	$0,g^+$	0	0	0	0	0	16	0	0	16	31
8375.6	0.8655	$1,g$								1	11	<25
8376.5	0.8574	$2,g$	0	1	1	1	1	7	1	2	8	30
		$2,g$	0	1	1	1	−1	7	3	2	8	48
8376.8	0.8494	$2,u$	2	0	0	3	−1	3	3	2	6	65
8378.7	0.8818	$0,u^-$	0	0	0	11	−3	5	3	0	16	26
8379.5	0.8658	$1,u$	1	0	0	2	2	9	−1	1	11	37
		$1,u$	1	0	0	2	0	9	1	1	11	26
8379.8	0.8512	$2,u$	0	3	0	3	−1	3	3	3	6	66
8380.4	0.8494	$0,u^-$	2	0	0	3	−1	3	1	2	6	58
8381.6	0.8723	$1,g$	0	1	0	7	7	6	−6	1	13	49
8381.8	0.8817	$0,g^-$	0	0	0	12	−4	4	4	0	16	56
8382.1	0.8819	$2,g$	0	0	0	0	0	16	2	0	16	28
8383.2	0.8573	$0,g^-$	0	1	1	1	−1	7	1	2	8	42
		$0,g^-$	0	1	1	3	−1	5	1	2	8	37
8383.7	0.8819	$2,u$								0	16	<25

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8383.7	0.8512	$0,u^-$	0	3	0	3	−1	3	1	3	6	54
8384.3	0.8537	$1,u$	0	0	2	4	2	3	−1	2	7	46
8384.4	0.8537	$1,g$	0	0	2	3	1	4	0	2	7	35
		$1,g$	0	0	2	5	1	2	0	2	7	42
8384.4	0.8817	$0,u^-$	0	0	0	11	−3	5	3	0	16	28
		$0,u^-$	0	0	0	11	−1	5	1	0	16	38
8385.5	0.8818	$2,u$								0	16	<25
8385.6	0.8724	$1,u$								1	13	<25
8385.8	0.8494	$2,u$	2	0	0	3	1	3	1	2	6	41
8385.9	0.8817	$0,g^+$	0	0	0	12	4	4	−4	0	16	37
8386.1	0.8537	$1,g$	0	0	2	3	3	4	−2	2	7	31
		$1,g$	0	0	2	5	3	2	−2	2	7	61
8387.1	0.8537	$1,u$	0	0	2	4	0	3	1	2	7	43
8388.9	0.8512	$2,u$	0	3	0	3	1	3	1	3	6	40
8389.4	0.8573	$2,g$	0	1	1	1	1	7	1	2	8	28
8390.3	0.8818	$2,g$								0	16	<25
8390.9	0.8537	$1,u$	0	0	2	4	4	3	−3	2	7	96
8391.7	0.8656	$1,u$	1	0	0	0	0	11	1	1	11	27
8392.6	0.8537	$1,g$	0	0	2	3	−1	4	2	2	7	35
		$1,g$	0	0	2	5	−1	2	2	2	7	46
8393.7	0.8817	$0,u^+$	0	0	0	7	1	9	−1	0	16	40
8396.1	0.8411	$1,g$	1	1	1	0	0	3	1	3	3	97
8396.6	0.8495	$0,g^+$	2	0	0	2	2	4	−2	2	6	64
		$0,g^+$	2	0	0	2	0	4	0	2	6	30
8396.7	0.8818	$0,g^-$								0	16	<25
8397.3	0.8817	$0,u^+$								0	16	<25
8397.4	0.8818	$0,g^+$								0	16	<25
8397.9	0.8574	$0,u^+$	0	1	1	0	0	8	0	2	8	62
8398.3	0.8513	$0,g^+$	0	3	0	2	2	4	−2	3	6	64
		$0,g^+$	0	3	0	2	0	4	0	3	6	30
8401.1	0.8537	$1,u$	0	0	2	4	−2	3	3	2	7	69
8401.4	0.8495	$0,g^-$	2	0	0	2	−2	4	2	2	6	91
8402.0	0.8816	$2,u$								0	16	<25
8402.4	0.8350	$1,g$	1	3	0	1	1	0	0	4	1	99
8402.8	0.8659	$1,g$	1	0	0	1	1	10	0	1	11	32
		$1,g$	1	0	0	1	−1	10	2	1	11	37
8403.3	0.8513	$0,g^-$	0	3	0	2	−2	4	2	3	6	90
8403.4	0.8724	$1,g$	0	1	0	7	7	6	−6	1	13	32
8404.2	0.8495	$2,g$	2	0	0	2	0	4	2	2	6	28
		$2,g$	2	0	0	2	−2	4	4	2	6	44
8404.6	0.8575	$2,u$	0	1	1	0	0	8	2	2	8	64
8405.1	0.8816	$2,u$	0	0	0	11	−1	5	3	0	16	32
8405.8	0.8513	$2,g$	0	3	0	2	0	4	2	3	6	28
		$2,g$	0	3	0	2	−2	4	4	3	6	47
8407.4	0.8820	$0,g^+$								0	16	<25
8408.1	0.8495	$2,g$	2	0	0	2	2	4	0	2	6	43
		$2,g$	2	0	0	2	−2	4	4	2	6	48
8408.4	0.8818	$2,g$	0	0	0	8	0	8	2	0	16	25
8409.3	0.8724	$1,u$								1	13	<25
8409.8	0.8513	$2,g$	0	3	0	2	2	4	0	3	6	43
		$2,g$	0	3	0	2	−2	4	4	3	6	45
8411.0	0.8495	$0,g^+$	2	0	0	2	0	4	0	2	6	44
8411.2	0.8724	$1,g$								1	13	<25
8411.3	0.8820	$2,g$								0	16	<25
8412.3	0.8723	$1,u$	0	1	0	6	−6	7	7	1	13	47
8412.3	0.8536	$1,u$	0	0	2	6	2	1	−1	2	7	37
8412.6	0.8657	$1,g$								1	11	<25
8412.9	0.8538	$1,g$	0	0	2	3	−3	4	4	2	7	90
8412.9	0.8513	$0,g^+$	0	3	0	2	0	4	0	3	6	42
8413.6	0.8822	$0,u^+$	0	0	0	1	1	15	−1	0	16	52
8416.9	0.8495	$2,g$	2	0	0	2	0	4	2	2	6	47
8417.3	0.8536	$1,g$	0	0	2	3	1	4	0	2	7	25
		$1,g$	0	0	2	7	1	0	0	2	7	46
8417.9	0.8819	$2,u$								0	16	<25

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8418.8	0.8513	2,g	0	3	0	2	0	4	2	3	6	45
8419.6	0.8819	0,u^+								0	16	<25
8419.8	0.8818	0,g^+								0	16	<25
8420.5	0.8537	1,g	0	0	2	3	3	4	−2	2	7	44
8421.7	0.8817	2,g	0	0	0	12	−2	4	4	0	16	26
8424.6	0.8841	1,u								0	17	<25
8424.6	0.8841	1,g								0	17	<25
8425.1	0.8659	1,u	1	0	0	0	0	11	1	1	11	46
8425.3	0.8820	2,u								0	16	<25
8425.5	0.8537	1,u	0	0	2	6	0	1	1	2	7	41
8426.2	0.8818	2,g								0	16	<25
8427.1	0.8690	0,u^+								1	12	<25
8427.1	0.8690	0,g^-	0	0	1	3	−1	9	1	1	12	30
		0,g^-	0	0	1	5	−1	7	1	1	12	27
8428.7	0.8822	0,g^+	0	0	0	2	2	14	−2	0	16	27
		0,g^+	0	0	0	2	0	14	0	0	16	50
8428.8	0.8537	1,g	0	0	2	5	−1	2	2	2	7	31
8430.1	0.8818	2,u								0	16	<25
8430.6	0.8375	0,g^+	1	0	2	2	0	0	0	3	2	98
8430.9	0.8817	0,u^-								0	16	<25
8431.2	0.8815	0,g^-	0	0	0	12	−2	4	2	0	16	71
8432.6	0.8821	0,u^+	0	0	0	3	1	13	−1	0	16	56
8433.1	0.8375	2,g	1	0	2	2	2	0	0	3	2	99
8434.5	0.8820	2,g	0	0	0	2	0	14	2	0	16	29
8434.9	0.8690	2,g								1	12	<25
8434.9	0.8690	2,g								1	12	<25
8435.0	0.8819	0,g^+								0	16	<25
8435.7	0.8496	0,u^+	2	0	0	1	1	5	−1	2	6	93
8435.9	0.8513	0,u^+	0	3	0	1	1	5	−1	3	6	92
8438.1	0.8723	1,g								1	13	<25
8438.7	0.8818	2,u								0	16	<25
8438.8	0.8819	2,g								0	16	<25
8439.4	0.8723	1,u	0	1	0	8	6	5	−5	1	13	37
8440.9	0.8538	1,u	0	0	2	2	−2	5	3	2	7	42
8441.2	0.8819	0,u^+								0	16	<25
8441.8	0.8820	2,u	0	0	0	3	1	13	1	0	16	33
8442.4	0.8537	1,g	0	0	2	5	1	2	0	2	7	30
8442.4	0.8814	0,u^-	0	0	0	13	−3	3	3	0	16	71
8443.0	0.8496	2,u	2	0	0	1	1	5	1	2	6	43
		2,u	2	0	0	1	−1	5	3	2	6	51
8443.2	0.8513	2,u	0	3	0	1	1	5	1	3	6	42
		2,u	0	3	0	1	−1	5	3	3	6	52
8443.8	0.8496	0,u^-	2	0	0	1	−1	5	1	2	6	81
8444.4	0.8513	0,u^-	0	3	0	1	−1	5	1	3	6	80
8444.5	0.8817	2,g								0	16	<25
8445.7	0.8819	0,g^+								0	16	<25
8447.0	0.8723	1,u	0	1	0	6	6	7	−5	1	13	28
8448.5	0.8538	1,u	0	0	2	2	2	5	−1	2	7	34
		1,u	0	0	2	2	−2	5	3	2	7	25
8449.4	0.8723	1,g								1	13	<25
8450.3	0.8351	1,u	1	3	0	0	0	1	1	4	1	99
8450.4	0.8496	2,u	2	0	0	1	1	5	1	2	6	43
		2,u	2	0	0	1	−1	5	3	2	6	40
8450.9	0.8513	2,u	0	3	0	1	1	5	1	3	6	43
		2,u	0	3	0	1	−1	5	3	3	6	39
8451.2	0.8816	0,u^+	0	0	0	13	3	3	−3	0	16	39
8451.6	0.8819	2,u								0	16	<25
8454.2	0.8819	2,g								0	16	<25
8454.5	0.8723	1,u	0	1	0	8	6	5	−5	1	13	28
8455.6	0.8375	0,u^+	1	0	2	1	1	1	−1	3	2	99
8459.4	0.8476	1,u	0	2	1	5	1	0	0	3	5	86
8460.8	0.8538	1,u	0	0	2	0	0	7	1	2	7	28
8462.4	0.8723	1,g	0	1	0	7	−5	6	6	1	13	29
8462.8	0.8375	0,u^-	1	0	2	1	−1	1	1	3	2	99

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8463.6	0.8816	$0,g^+$	0	0	0	12	0	4	0	0	16	30
8464.2	0.8476	$1,g$	0	2	1	4	2	1	−1	3	5	63
		$1,g$	0	2	1	4	0	1	1	3	5	30
8464.7	0.8560	$2,g$	1	1	0	6	4	2	−2	2	8	72
8465.5	0.8560	$2,u$	1	1	0	5	5	3	−3	2	8	34
		$2,u$	1	1	0	7	3	1	−1	2	8	32
8465.5	0.8561	$0,g^+$	1	1	0	4	0	4	0	2	8	25
		$0,g^+$	1	1	0	6	0	2	0	2	8	31
8465.9	0.8375	$2,u$	1	0	2	1	1	1	1	3	2	99
8466.0	0.8561	$0,u^-$	1	1	0	3	−1	5	1	2	8	26
		$0,u^-$	1	1	0	5	−1	3	1	2	8	41
8467.0	0.8539	$1,g$	0	0	2	1	1	6	0	2	7	32
		$1,g$	0	0	2	1	−1	6	2	2	7	43
8467.3	0.8560	$0,u^+$	1	1	0	5	1	3	−1	2	8	30
		$0,u^+$	1	1	0	7	1	1	−1	2	8	56
8467.7	0.8815	$2,u$	0	0	0	13	3	3	−1	0	16	26
8467.8	0.8560	$2,u$	1	1	0	5	5	3	−3	2	8	63
8468.7	0.8814	$0,u^+$	0	0	0	13	1	3	−1	0	16	64
8469.6	0.8560	$2,g$	1	1	0	4	2	4	0	2	8	25
		$2,g$	1	1	0	6	2	2	0	2	8	47
8469.9	0.8560	$0,g^+$	1	1	0	6	2	2	−2	2	8	54
8471.4	0.8816	$2,g$	0	0	0	12	0	4	2	0	16	27
8472.4	0.8560	$0,g^-$	1	1	0	4	−2	4	2	2	8	32
		$0,g^-$	1	1	0	6	−2	2	2	2	8	57
8473.9	0.8560	$2,u$	1	1	0	5	1	3	1	2	8	35
		$2,u$	1	1	0	7	1	1	1	2	8	33
8474.2	0.8514	$0,g^+$	0	3	0	0	0	6	0	3	6	88
8475.4	0.8496	$0,g^+$	2	0	0	0	0	6	0	2	6	89
8476.3	0.8814	$2,u$	0	0	0	13	−1	3	3	0	16	58
8477.4	0.8476	$1,g$	0	2	1	4	2	1	−1	3	5	27
		$1,g$	0	2	1	4	0	1	1	3	5	57
8477.8	0.8723	$1,u$	0	1	0	8	−4	5	5	1	13	31
8478.9	0.8723	$1,g$								1	13	<25
8479.3	0.8561	$0,u^+$	1	1	0	5	3	3	−3	2	8	72
8480.2	0.8689	$0,u^-$	0	0	1	4	−4	8	4	1	12	26
8480.2	0.8561	$0,u^-$	1	1	0	5	−3	3	3	2	8	74
8480.3	0.8689	$0,g^+$	0	0	1	5	3	7	−3	1	12	29
8480.7	0.8477	$1,u$	0	2	1	3	3	2	−2	3	5	75
8481.4	0.8514	$2,g$	0	3	0	0	0	6	2	3	6	90
8482.1	0.8538	$1,g$								2	7	<25
8482.4	0.8560	$2,g$	1	1	0	4	0	4	2	2	8	26
		$2,g$	1	1	0	6	0	2	2	2	8	51
8482.7	0.8497	$2,g$	2	0	0	0	0	6	2	2	6	90
8483.4	0.8814	$2,g$	0	0	0	14	4	2	−2	0	16	63
8487.1	0.8689	$2,g$								1	12	<25
8487.2	0.8841	$1,g$								0	17	<25
8487.2	0.8841	$1,u$								0	17	<25
8487.5	0.8689	$2,u$								1	12	<25
8488.6	0.8477	$1,u$	0	2	1	3	−1	2	2	3	5	57
8488.7	0.8723	$1,u$								1	13	<25
8489.1	0.8723	$1,g$								1	13	<25
8490.8	0.8814	$0,g^+$	0	0	0	14	2	2	−2	0	16	49
		$0,g^+$	0	0	0	14	0	2	0	0	16	33
8490.9	0.8561	$0,g^+$	1	1	0	4	4	4	−4	2	8	93
8491.0	0.8561	$0,g^-$	1	1	0	4	−4	4	4	2	8	92
8493.4	0.8376	$0,g^+$	1	0	2	0	0	2	0	3	2	98
8493.5	0.8559	$0,g^+$	1	1	0	8	0	0	0	2	8	78
8493.9	0.8560	$2,u$								2	8	<25
8493.9	0.8539	$1,u$	0	0	2	0	0	7	1	2	7	60
8493.9	0.8560	$0,u^+$	1	1	0	5	1	3	−1	2	8	35
		$0,u^+$	1	1	0	7	1	1	−1	2	8	41
8495.6	0.8722	$1,g$	0	1	0	9	5	4	−4	1	13	46
8496.0	0.8559	$2,g$	1	1	0	8	2	0	0	2	8	78
8496.4	0.8561	$2,u$	1	1	0	5	−1	3	3	2	8	49

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8498.9	0.8477	1,u	0	2	1	3	1	2	0	3	5	44
		1,u	0	2	1	3	−1	2	2	3	5	29
8500.0	0.8416	1,g	0	4	0	3	1	0	0	4	3	98
8501.4	0.8376	2,g	1	0	2	0	0	2	2	3	2	99
8501.4	0.8723	1,u								1	13	<25
8501.8	0.8815	0,u^-	0	0	0	13	−1	3	1	0	16	69
8502.0	0.8724	1,g								1	13	<25
8504.2	0.8561	2,g	1	1	0	4	4	4	−2	2	8	68
8504.6	0.8723	1,u								1	13	<25
8506.1	0.8560	0,u^-	1	1	0	7	−1	1	1	2	8	66
8506.2	0.8813	0,g^-	0	0	0	14	−2	2	2	0	16	96
8509.0	0.8332	1,g	3	0	0	1	1	0	0	3	1	99
8509.4	0.8815	2,u	0	0	0	13	1	3	1	0	16	44
8509.6	0.8561	0,g^+	1	1	0	4	2	4	−2	2	8	41
		0,g^+	1	1	0	4	0	4	0	2	8	29
8510.4	0.8478	1,g	0	2	1	2	2	3	−1	3	5	31
		1,g	0	2	1	2	0	3	1	3	5	30
		1,g	0	2	1	2	−2	3	3	3	5	34
8510.8	0.8560	2,u	1	1	0	7	1	1	1	2	8	51
8510.8	0.8689	0,u^+	0	0	1	6	6	6	−6	1	12	54
8513.3	0.8688	2,g	0	0	1	7	7	5	−5	1	12	65
8513.4	0.8561	2,g	1	1	0	4	−2	4	4	2	8	75
8513.6	0.8561	0,g^-	1	1	0	4	−2	4	2	2	8	38
		0,g^-	1	1	0	6	−2	2	2	2	8	39
8513.9	0.8723	1,g								1	13	<25
8514.8	0.8814	2,g	0	0	0	14	2	2	0	0	16	31
		2,g	0	0	0	14	0	2	2	0	16	44
8514.9	0.8689	0,g^-	0	0	1	5	−5	7	5	1	12	46
8515.6	0.8478	1,g	0	2	1	2	2	3	−1	3	5	40
		1,g	0	2	1	2	−2	3	3	3	5	55
8516.6	0.8723	1,u								1	13	<25
8520.3	0.8722	1,g	0	1	0	9	−3	4	4	1	13	30
8520.7	0.8723	1,u								1	13	<25
8520.8	0.8561	2,g								2	8	<25
8521.1	0.8689	2,u	0	0	1	6	6	6	−4	1	12	37
8523.4	0.8840	1,g								0	17	<25
8523.7	0.8840	1,u								0	17	<25
8525.1	0.8478	1,g	0	2	1	2	0	3	1	3	5	48
8525.9	0.8561	0,g^+	1	1	0	6	0	2	0	2	8	35
8526.0	0.8722	1,u								1	13	<25
8526.2	0.8688	0,u^-	0	0	1	6	−6	6	6	1	12	83
8526.7	0.8417	1,u	0	4	0	2	2	1	−1	4	3	72
		1,u	0	4	0	2	0	1	1	4	3	28
8529.8	0.8562	0,u^+	1	1	0	3	3	5	−3	2	8	69
8529.9	0.8562	0,u^-	1	1	0	3	−3	5	3	2	8	76
8530.6	0.8722	1,g	0	1	0	9	−1	4	2	1	13	29
8530.9	0.8561	2,g	1	1	0	6	2	2	0	2	8	25
		2,g	1	1	0	6	0	2	2	2	8	26
8532.2	0.8562	2,u	1	1	0	3	−3	5	5	2	8	92
8533.3	0.8689	2,g								1	12	<25
8535.3	0.8723	1,g	0	1	0	7	1	6	0	1	13	30
		1,g	0	1	0	7	−1	6	2	1	13	26
8537.2	0.8417	1,u	0	4	0	2	2	1	−1	4	3	28
		1,u	0	4	0	2	0	1	1	4	3	70
8537.5	0.8722	1,g	0	1	0	9	1	4	0	1	13	32
8537.7	0.8722	1,u								1	13	<25
8538.1	0.8689	0,u^+								1	12	<25
8539.2	0.8689	0,g^-	0	0	1	7	−1	5	1	1	12	27
8540.0	0.8562	2,u	1	1	0	3	3	5	−1	2	8	60
8540.9	0.8724	1,u								1	13	<25
8541.0	0.8562	0,u^+	1	1	0	3	1	5	−1	2	8	50
8543.1	0.8689	0,g^+	0	0	1	5	5	7	−5	1	12	37
		0,g^+	0	0	1	7	5	5	−5	1	12	34
8543.5	0.8814	0,g^+	0	0	0	14	2	2	−2	0	16	35

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,g^+$	0	0	0	14	0	2	0	0	16	56
8544.5	0.8478	$1,u$	0	2	1	1	1	4	0	3	5	45
		$1,u$	0	2	1	1	−1	4	2	3	5	49
8545.5	0.8689	$2,u$								1	12	<25
8546.0	0.8689	$0,u^+$	0	0	1	6	6	6	−6	1	12	34
8546.2	0.8813	$2,u$	0	0	0	15	3	1	−1	0	16	69
8546.5	0.8689	$2,g$								1	12	<25
8546.5	0.8723	$1,u$								1	13	<25
8546.7	0.8813	$0,u^+$	0	0	0	15	1	1	−1	0	16	94
8547.1	0.8562	$2,u$	1	1	0	3	−1	5	3	2	8	42
8550.0	0.8814	$2,g$	0	0	0	14	2	2	0	0	16	41
		$2,g$	0	0	0	14	0	2	2	0	16	44
8550.4	0.8315	$0,u^+$	1	2	1	0	0	0	0	4	0	99
8550.6	0.8561	$0,u^-$	1	1	0	1	−1	7	1	2	8	29
		$0,u^-$	1	1	0	5	−1	3	1	2	8	42
8551.6	0.8689	$2,u$								1	12	<25
8553.8	0.8478	$1,u$	0	2	1	1	1	4	0	3	5	43
		$1,u$	0	2	1	1	−1	4	2	3	5	42
8556.1	0.8398	$1,g$	2	1	0	3	1	0	0	3	3	98
8556.1	0.8722	$1,u$								1	13	<25
8556.2	0.8561	$2,u$	1	1	0	5	1	3	1	2	8	30
8557.5	0.8689	$2,g$	0	0	1	5	−5	7	7	1	12	46
8557.6	0.8724	$1,g$								1	13	<25
8558.5	0.8333	$1,u$	3	0	0	0	0	1	1	3	1	99
8561.0	0.8721	$1,g$	0	1	0	11	3	2	−2	1	13	47
8561.8	0.8840	$1,g$	0	0	0	9	9	8	−8	0	17	35
8564.2	0.8840	$1,u$								0	17	<25
8565.9	0.8563	$0,g^+$	1	1	0	2	2	6	−2	2	8	59
		$0,g^+$	1	1	0	2	0	6	0	2	8	28
8567.5	0.8417	$1,g$	0	4	0	1	1	2	0	4	3	55
		$1,g$	0	4	0	1	−1	2	2	4	3	45
8568.0	0.8723	$1,g$								1	13	<25
8568.2	0.8689	$0,u^-$	0	0	1	6	−4	6	4	1	12	29
8568.2	0.8562	$0,g^-$	1	1	0	2	−2	6	2	2	8	73
8568.5	0.8688	$0,g^+$								1	12	<25
8569.3	0.8687	$2,u$	0	0	1	8	6	4	−4	1	12	60
8569.3	0.8723	$1,u$								1	13	<25
8570.6	0.8723	$1,g$								1	13	<25
8571.5	0.8563	$2,g$	1	1	0	2	−2	6	4	2	8	70
8571.7	0.8688	$0,g^-$	0	0	1	7	−5	5	5	1	12	66
8571.9	0.8723	$1,u$								1	13	<25
8573.7	0.8723	$1,g$	0	1	0	11	−1	2	2	1	13	27
8574.7	0.8688	$2,g$								1	12	<25
8575.5	0.8417	$1,g$	0	4	0	1	1	2	0	4	3	44
		$1,g$	0	4	0	1	−1	2	2	4	3	55
8575.7	0.8562	$2,g$	1	1	0	2	2	6	0	2	8	56
8577.6	0.8724	$1,u$	0	1	0	4	0	9	1	1	13	30
8578.2	0.8562	$0,g^+$	1	1	0	4	0	4	0	2	8	26
8579.5	0.8689	$0,u^-$	0	0	1	4	−4	8	4	1	12	28
		$0,u^-$	0	0	1	6	−2	6	2	1	12	32
8579.8	0.8688	$2,u$								1	12	<25
8580.6	0.8479	$1,g$	0	2	1	0	0	5	1	3	5	91
8581.0	0.8525	$1,g$	1	0	1	4	2	3	−1	2	7	26
		$1,g$	1	0	1	6	2	1	−1	2	7	50
8581.7	0.8689	$0,g^-$	0	0	1	5	−5	7	5	1	12	40
8582.4	0.8525	$1,u$	1	0	1	5	1	2	0	2	7	49
8583.6	0.8688	$0,g^+$	0	0	1	7	5	5	−5	1	12	35
8584.3	0.8399	$1,u$	2	1	0	2	2	1	−1	3	3	71
		$1,u$	2	1	0	2	0	1	1	3	3	28
8584.4	0.8562	$2,g$								2	8	<25
8585.1	0.8813	$0,u^-$	0	0	0	15	−1	1	1	0	16	97
8585.9	0.8526	$1,u$	1	0	1	5	3	2	−2	2	7	54
8586.0	0.8688	$0,u^+$	0	0	1	4	4	8	−4	1	12	30
		$0,u^+$	0	0	1	8	4	4	−4	1	12	44

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8587.5	0.8689	2,u								1	12	<25
8587.7	0.8526	1,g	1	0	1	4	0	3	1	2	7	34
		1,g	1	0	1	6	0	1	1	2	7	32
8588.8	0.8689	2,g								1	12	<25
8588.9	0.8441	0,g^+	0	1	2	4	0	0	0	3	4	90
8589.5	0.8813	2,u	0	0	0	15	3	1	−1	0	16	25
		2,u	0	0	0	15	1	1	1	0	16	71
8591.0	0.8725	1,g								1	13	<25
8591.6	0.8441	2,g	0	1	2	4	2	0	0	3	4	92
8592.6	0.8688	2,g								1	12	<25
8592.8	0.8526	1,g	1	0	1	4	4	3	−3	2	7	95
8592.8	0.8840	1,g	0	0	0	9	9	8	−8	0	17	35
8593.6	0.8526	1,u	1	0	1	3	−1	4	2	2	7	26
		1,u	1	0	1	5	−1	2	2	2	7	64
8594.8	0.8399	1,u	2	1	0	2	2	1	−1	3	3	28
		1,u	2	1	0	2	0	1	1	3	3	70
8596.4	0.8721	1,g	0	1	0	11	−1	2	2	1	13	26
8597.1	0.8442	0,u^+	0	1	2	3	1	1	−1	3	4	95
8598.1	0.8723	1,u								1	13	<25
8598.5	0.8689	2,u	0	0	1	4	−4	8	6	1	12	33
8599.2	0.8442	2,u	0	1	2	3	3	1	−1	3	4	82
8599.9	0.8840	1,u	0	0	0	8	−8	9	9	0	17	33
8600.1	0.8563	0,u^+	1	1	0	1	1	7	−1	2	8	85
8604.1	0.8688	0,u^-	0	0	1	8	−4	4	4	1	12	45
8605.0	0.8526	1,g	1	0	1	4	−2	3	3	2	7	71
8605.1	0.8722	1,u	0	1	0	12	2	1	−1	1	13	26
8605.3	0.8689	0,g^-	0	0	1	7	−3	5	3	1	12	38
8606.6	0.8724	1,u								1	13	<25
8606.8	0.8563	2,u	1	1	0	1	1	7	1	2	8	31
		2,u	1	1	0	1	−1	7	3	2	8	54
8607.2	0.8525	1,u	1	0	1	7	1	0	0	2	7	68
8607.4	0.8563	0,u^-	1	1	0	1	−1	7	1	2	8	58
		0,u^-	1	1	0	3	−1	5	1	2	8	31
8608.5	0.8442	0,u^-	0	1	2	3	−1	1	1	3	4	90
8610.8	0.8629	0,u^-	0	2	0	3	−1	7	1	2	10	29
		0,u^-	0	2	0	5	−1	5	1	2	10	30
8610.9	0.8629	0,g^+								2	10	<25
8611.3	0.8526	1,g	1	0	1	4	2	3	−1	2	7	29
8612.3	0.8688	2,g	0	0	1	7	−3	5	5	1	12	28
8612.3	0.8442	2,u	0	1	2	3	1	1	1	3	4	75
8613.7	0.8840	1,u	0	0	0	8	8	9	−7	0	17	27
8613.7	0.8418	1,u	0	4	0	0	0	3	1	4	3	98
8613.7	0.8724	1,u								1	13	<25
8614.0	0.8563	2,u	1	1	0	1	1	7	1	2	8	39
8614.2	0.8687	0,u^+	0	0	1	8	4	4	−4	1	12	30
		0,u^+	0	0	1	8	2	4	−2	1	12	30
8614.8	0.8689	2,u								1	12	<25
8615.9	0.8687	2,g	0	0	1	9	5	3	−3	1	12	44
8616.1	0.8840	1,g								0	17	<25
8616.2	0.8723	1,g								1	13	<25
8616.9	0.8442	0,g^+	0	1	2	2	2	2	−2	3	4	67
		0,g^+	0	1	2	2	0	2	0	3	4	29
8617.0	0.8688	0,g^+	0	0	1	7	1	5	−1	1	12	51
8617.1	0.8629	2,g								2	10	<25
8617.1	0.8629	2,u								2	10	<25
8618.1	0.8688	0,u^+	0	0	1	6	2	6	−2	1	12	30
8621.5	0.8689	0,u^+								1	12	<25
8621.6	0.8812	0,g^+	0	0	0	16	0	0	0	0	16	98
8621.7	0.8527	1,u	1	0	1	3	−3	4	4	2	7	90
8622.0	0.8442	0,g^-	0	1	2	2	−2	2	2	3	4	99
8622.1	0.8689	0,g^-	0	0	1	1	−1	11	1	1	12	27
8622.6	0.8688	0,u^-	0	0	1	4	−4	8	4	1	12	26
		0,u^-	0	0	1	6	−4	6	4	1	12	31
8623.0	0.8726	1,g	0	1	0	1	1	12	0	1	13	31

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8623.6	0.8812	2,*g*	0	0	0	16	2	0	0	0	16	98
8624.1	0.8526	1,*g*	1	0	1	6	0	1	1	2	7	38
8625.6	0.8527	1,*u*	1	0	1	3	3	4	−2	2	7	63
8626.1	0.8442	2,*g*	0	1	2	2	2	2	0	3	4	59
		2,*g*	0	1	2	2	0	2	2	3	4	36
8626.5	0.8400	1,*g*	2	1	0	1	1	2	0	3	3	55
		1,*g*	2	1	0	1	−1	2	2	3	3	44
8627.4	0.8689	2,*u*	0	0	1	8	2	4	0	1	12	28
8627.4	0.8688	2,*g*	0	0	1	7	−1	5	3	1	12	27
8627.7	0.8688	$0,g^+$	0	0	1	5	3	7	−3	1	12	29
		$0,g^+$	0	0	1	9	3	3	−3	1	12	45
8628.4	0.8688	2,*u*								1	12	<25
8629.0	0.8688	2,*g*	0	0	1	7	1	5	1	1	12	34
8630.7	0.8679	$0,u^-$	1	0	0	3	−1	9	1	1	12	26
		$0,u^-$	1	0	0	5	−1	7	1	1	12	29
8630.7	0.8679	$0,g^+$								1	12	<25
8631.1	0.8442	$0,g^+$	0	1	2	2	2	2	−2	3	4	32
		$0,g^+$	0	1	2	2	0	2	0	3	4	54
8632.6	0.8564	$0,g^+$	1	1	0	0	0	8	0	2	8	77
8633.4	0.8688	2,*u*								1	12	<25
8634.4	0.8628	2,*g*	0	2	0	6	6	4	−4	2	10	75
8634.5	0.8400	1,*g*	2	1	0	1	1	2	0	3	3	43
		1,*g*	2	1	0	1	−1	2	2	3	3	55
8634.6	0.8527	1,*u*	1	0	1	3	−1	4	2	2	7	34
8636.0	0.8442	2,*g*	0	1	2	2	2	2	0	3	4	32
		2,*g*	0	1	2	2	0	2	2	3	4	59
8636.0	0.8628	$0,u^+$	0	2	0	5	3	5	−3	2	10	31
8636.1	0.8687	$0,g^+$	0	0	1	9	1	3	−1	1	12	48
8636.3	0.8628	$0,g^-$								2	10	<25
8636.5	0.8688	$0,g^-$	0	0	1	9	−3	3	3	1	12	50
8636.6	0.8688	$0,u^+$	0	0	1	8	0	4	0	1	12	26
8637.3	0.8689	2,*g*	0	0	1	5	−3	7	5	1	12	33
8637.4	0.8840	1,*g*								0	17	<25
8637.6	0.8724	1,*u*								1	13	<25
8637.6	0.8688	$0,u^-$	0	0	1	2	−2	10	2	1	12	32
		$0,u^-$	0	0	1	8	−2	4	2	1	12	39
8638.1	0.8679	2,*u*								1	12	<25
8638.1	0.8679	2,*g*								1	12	<25
8638.7	0.8689	$0,g^+$	0	0	1	5	1	7	−1	1	12	32
8639.0	0.8628	2,*u*	0	2	0	5	5	5	−3	2	10	33
		2,*u*	0	2	0	7	5	3	−3	2	10	29
8639.0	0.8840	1,*u*								0	17	<25
8639.6	0.8564	2,*g*	1	1	0	0	0	8	2	2	8	78
8641.6	0.8687	2,*u*								1	12	<25
8641.8	0.8688	2,*g*	0	0	1	9	3	3	−1	1	12	27
8643.7	0.8722	1,*g*								1	13	<25
8645.6	0.8526	1,*u*	1	0	1	5	1	2	0	2	7	29
8646.2	0.8688	2,*u*								1	12	<25
8647.1	0.8443	$0,u^+$	0	1	2	1	1	3	−1	3	4	95
8647.2	0.8628	2,*g*	0	2	0	6	4	4	−2	2	10	27
8649.1	0.8688	2,*g*								1	12	<25
8649.3	0.8628	$0,u^-$	0	2	0	5	−5	5	5	2	10	64
8650.3	0.8689	$0,u^+$								1	12	<25
8652.1	0.8628	$0,g^+$	0	2	0	4	4	6	−4	2	10	27
		$0,g^+$	0	2	0	6	4	4	−4	2	10	51
8652.7	0.8721	1,*u*	0	1	0	12	0	1	1	1	13	30
8654.7	0.8527	1,*g*	1	0	1	2	0	5	1	2	7	27
		1,*g*	1	0	1	2	−2	5	3	2	7	44
8654.7	0.8688	2,*u*								1	12	<25
8654.9	0.8443	2,*u*	0	1	2	1	1	3	1	3	4	46
		2,*u*	0	1	2	1	−1	3	3	3	4	51
8655.7	0.8628	2,*u*								2	10	<25
8656.7	0.8443	$0,u^-$	0	1	2	1	−1	3	1	3	4	90
8656.8	0.8688	$0,g^-$								1	12	<25

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8657.3	0.8382	$0,u^+$	0	3	1	2	0	0	0	4	2	99
8658.2	0.8628	$0,u^+$	0	2	0	5	5	5	−5	2	10	71
8659.5	0.8840	$1,u$	0	0	0	10	8	7	−7	0	17	46
8659.5	0.8718	$1,g$	0	1	0	13	1	0	0	1	13	84
8659.7	0.8382	$2,u$	0	3	1	2	2	0	0	4	2	100
8659.8	0.8527	$1,g$	1	0	1	2	2	5	−1	2	7	43
		$1,g$	1	0	1	2	−2	5	3	2	7	31
8659.9	0.8686	$0,u^+$	0	0	1	10	2	2	−2	1	12	45
		$0,u^+$	0	0	1	10	0	2	0	1	12	35
8660.2	0.8688	$2,u$								1	12	<25
8662.7	0.8443	$2,u$	0	1	2	1	1	3	1	3	4	46
		$2,u$	0	1	2	1	−1	3	3	3	4	48
8662.9	0.8840	$1,g$	0	0	0	9	−7	8	8	0	17	32
8663.2	0.8690	$0,g^+$	0	0	1	3	1	9	−1	1	12	35
8663.9	0.8688	$2,g$								1	12	<25
8665.1	0.8628	$2,g$								2	10	<25
8666.1	0.8628	$0,g^-$	0	2	0	6	−4	4	4	2	10	45
		$0,g^-$	0	2	0	6	−2	4	2	2	10	29
8668.4	0.8628	$0,u^-$	0	2	0	5	−5	5	5	2	10	32
		$0,u^-$	0	2	0	5	−3	5	3	2	10	32
8670.0	0.8464	$1,g$	1	2	0	5	1	0	0	3	5	92
8670.4	0.8527	$1,g$								2	7	<25
8671.3	0.8690	$2,g$								1	12	<25
8673.4	0.8628	$2,u$								2	10	<25
8674.2	0.8401	$1,u$	2	1	0	0	0	3	1	3	3	98
8674.6	0.8688	$0,u^-$	0	0	1	10	−2	2	2	1	12	48
8675.1	0.8688	$0,g^+$								1	12	<25
8675.7	0.8627	$0,u^+$	0	2	0	7	3	3	−3	2	10	32
		$0,u^+$	0	2	0	7	1	3	−1	2	10	41
8676.2	0.8690	$0,u^+$	0	0	1	0	0	12	0	1	12	42
8676.5	0.8627	$0,g^+$	0	2	0	6	2	4	−2	2	10	32
8677.5	0.8840	$1,g$								0	17	<25
8678.1	0.8688	$2,u$								1	12	<25
8678.5	0.8678	$0,g^-$								1	12	<25
8678.6	0.8840	$1,u$								0	17	<25
8678.9	0.8678	$0,u^+$	1	0	0	5	3	7	−3	1	12	29
8679.6	0.8688	$0,g^-$	0	0	1	9	−1	3	1	1	12	33
8680.0	0.8627	$2,u$	0	2	0	5	5	5	−3	2	10	39
		$2,u$	0	2	0	7	5	3	−3	2	10	29
8680.0	0.8688	$2,g$								1	12	<25
8680.8	0.8840	$1,u$								0	17	<25
8680.9	0.8444	$0,g^+$	0	1	2	0	0	4	0	3	4	92
8681.0	0.8465	$1,u$	1	2	0	4	2	1	−1	3	5	65
		$1,u$	1	2	0	4	0	1	1	3	5	31
8681.0	0.8690	$0,u^+$	0	0	1	2	2	10	−2	1	12	40
8682.3	0.8840	$1,g$	0	0	0	7	−7	10	8	0	17	35
8682.6	0.8627	$2,g$	0	2	0	8	4	2	−2	2	10	40
8683.5	0.8678	$2,u$								1	12	<25
8684.4	0.8689	$2,u$	0	0	1	10	0	2	2	1	12	27
8684.9	0.8678	$2,g$								1	12	<25
8685.0	0.8628	$0,g^+$								2	10	<25
8685.2	0.8628	$0,u^-$	0	2	0	7	−1	3	1	2	10	33
8685.8	0.8364	$0,u^+$	2	0	1	2	0	0	0	3	2	98
8686.2	0.8628	$2,g$	0	2	0	6	2	4	0	2	10	27
8686.5	0.8688	$2,g$								1	12	<25
8686.7	0.8528	$1,u$	1	0	1	1	1	6	0	2	7	38
		$1,u$	1	0	1	1	−1	6	2	2	7	47
8687.4	0.8382	$0,g^+$	0	3	1	1	1	1	−1	4	2	100
8687.8	0.8690	$2,u$	0	0	1	2	2	10	0	1	12	26
8688.2	0.8364	$2,u$	2	0	1	2	2	0	0	3	2	99
8688.3	0.8444	$2,g$	0	1	2	0	0	4	2	3	4	94
8689.2	0.8627	$0,g^+$	0	2	0	8	0	2	0	2	10	31
8689.3	0.8627	$0,u^+$	0	2	0	7	3	3	−3	2	10	27
		$0,u^+$	0	2	0	9	1	1	−1	2	10	35

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8689.7	0.8627	$0,g^-$	0	2	0	8	−2	2	2	2	10	46
8690.4	0.8628	$2,u$								2	10	<25
8691.7	0.8628	$2,g$	0	2	0	8	2	2	0	2	10	34
8694.5	0.8687	$0,u^-$	0	0	1	10	−2	2	2	1	12	36
8694.6	0.8382	$0,g^-$	0	3	1	1	−1	1	1	4	2	100
8695.3	0.8465	$1,u$	1	2	0	4	2	1	−1	3	5	29
		$1,u$	1	2	0	4	0	1	1	3	5	61
8695.9	0.8687	$0,g^+$	0	0	1	11	1	1	−1	1	12	66
8696.4	0.8627	$2,u$								2	10	<25
8696.8	0.8528	$1,u$	1	0	1	1	1	6	0	2	7	34
		$1,u$	1	0	1	1	−1	6	2	2	7	28
8697.0	0.8628	$0,u^-$	0	2	0	7	−3	3	3	2	10	41
8697.7	0.8686	$2,g$	0	0	1	11	3	1	−1	1	12	48
8697.7	0.8382	$2,g$	0	3	1	1	1	1	1	4	2	100
8699.4	0.8628	$2,u$	0	2	0	5	−3	5	5	2	10	31
8700.1	0.8627	$2,g$	0	2	0	8	0	2	2	2	10	41
8700.8	0.8688	$2,u$								1	12	<25
8702.2	0.8689	$0,g^+$								1	12	<25
8702.8	0.8677	$2,u$	1	0	0	7	7	5	−5	1	12	64
8703.0	0.8628	$0,u^+$	0	2	0	5	1	5	−1	2	10	45
8703.4	0.8466	$1,g$	1	2	0	3	3	2	−2	3	5	73
8704.0	0.8628	$2,g$	0	2	0	4	−4	6	6	2	10	49
8704.5	0.8628	$0,g^-$	0	2	0	4	−4	6	4	2	10	44
8704.6	0.8678	$0,g^+$	1	0	0	6	6	6	−6	1	12	61
8704.8	0.8322	$0,g^+$	0	5	0	0	0	0	0	5	0	100
8705.9	0.8628	$0,g^+$	0	2	0	4	4	6	−4	2	10	40
8708.3	0.8690	$2,g$								1	12	<25
8708.7	0.8689	$0,u^+$								1	12	<25
8710.2	0.8678	$0,u^-$	1	0	0	5	−5	7	5	1	12	40
		$0,u^-$	1	0	0	7	−5	5	5	1	12	32
8711.9	0.8628	$2,u$								2	10	<25
8712.0	0.8466	$1,g$	1	2	0	3	−1	2	2	3	5	54
8712.6	0.8627	$0,u^+$	0	2	0	9	1	1	−1	2	10	51
8713.6	0.8840	$1,u$								0	17	<25
8715.0	0.8627	$2,u$	0	2	0	9	3	1	−1	2	10	30
8715.0	0.8689	$2,u$								1	12	<25
8715.2	0.8677	$2,g$	1	0	0	6	6	6	−4	1	12	31
8716.1	0.8863	$0,u^-$	0	0	0	5	−1	13	1	0	18	26
8716.1	0.8863	$0,g^+$								0	18	<25
8716.7	0.8840	$1,g$								0	17	<25
8717.5	0.8365	$0,g^+$	2	0	1	1	1	1	−1	3	2	99
8717.9	0.8628	$2,g$	0	2	0	4	4	6	−2	2	10	40
8718.3	0.8529	$1,g$	1	0	1	0	0	7	1	2	7	78
8719.1	0.8677	$0,g^-$	1	0	0	6	−6	6	6	1	12	80
8719.3	0.8687	$0,g^-$	0	0	1	11	−1	1	1	1	12	36
8719.4	0.8406	$1,u$	0	0	3	3	1	0	0	3	3	94
8722.7	0.8466	$1,g$	1	2	0	3	1	2	0	3	5	46
		$1,g$	1	2	0	3	−1	2	2	3	5	34
8724.4	0.8863	$2,g$								0	18	<25
8724.4	0.8863	$2,u$								0	18	<25
8724.6	0.8365	$0,g^-$	2	0	1	1	−1	1	1	3	2	99
8725.2	0.8687	$2,g$	0	0	1	11	1	1	1	1	12	30
8727.4	0.8628	$0,g^+$								2	10	<25
8727.8	0.8365	$2,g$	2	0	1	1	1	1	1	3	2	99
8728.1	0.8678	$2,u$								1	12	<25
8728.2	0.8627	$0,g^+$	0	2	0	10	0	0	0	2	10	44
8728.9	0.8628	$0,g^-$	0	2	0	2	−2	8	2	2	10	27
		$0,g^-$	0	2	0	6	−2	4	2	2	10	35
		$0,g^-$	0	2	0	8	−2	2	2	2	10	33
8730.3	0.8383	$0,u^+$	0	3	1	0	0	2	0	4	2	99
8730.7	0.8627	$2,g$	0	2	0	10	2	0	0	2	10	44
8730.8	0.8407	$1,g$	0	0	3	2	2	1	−1	3	3	68
		$1,g$	0	0	3	2	0	1	1	3	3	30
8731.1	0.8627	$0,u^-$	0	2	0	9	−1	1	1	2	10	60

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8732.0	0.8628	2,*g*								2	10	<25
8733.2	0.8840	1,*g*	0	0	0	9	7	8	−6	0	17	26
8734.4	0.8687	0,u^+								1	12	<25
8735.9	0.8627	2,*u*	0	2	0	9	1	1	1	2	10	47
8736.1	0.8678	0,g^+								1	12	<25
8736.6	0.8628	2,*g*								2	10	<25
8736.7	0.8677	0,u^+	1	0	0	7	5	5	−5	1	12	48
8737.6	0.8840	1,*u*								0	17	<25
8738.1	0.8678	0,u^-	1	0	0	7	−1	5	1	1	12	29
8738.4	0.8383	2,*u*	0	3	1	0	0	2	2	4	2	100
8739.3	0.8746	0,u^-	0	1	0	5	−1	9	1	1	14	29
8739.3	0.8746	0,g^+								1	14	<25
8739.8	0.8687	2,*u*	0	0	1	12	2	0	0	1	12	28
8739.9	0.8467	1,*u*	1	2	0	2	2	3	−1	3	5	36
		1,*u*	1	2	0	2	0	3	1	3	5	32
		1,*u*	1	2	0	2	−2	3	3	3	5	29
8740.0	0.8629	0,u^-	0	2	0	3	−3	7	3	2	10	51
8740.6	0.8407	1,*g*	0	0	3	2	2	1	−1	3	3	30
		1,*g*	0	0	3	2	0	1	1	3	3	65
8740.6	0.8839	1,*u*	0	0	0	8	−6	9	7	0	17	27
		1,*u*	0	0	0	10	−6	7	7	0	17	36
8741.4	0.8678	0,g^+								1	12	<25
8742.1	0.8839	1,*g*	0	0	0	11	7	6	−6	0	17	51
8742.6	0.8629	2,*u*	0	2	0	3	−3	7	5	2	10	55
8743.2	0.8678	2,*g*								1	12	<25
8743.3	0.8629	0,u^+	0	2	0	3	3	7	−3	2	10	45
8744.2	0.8686	0,g^-	0	0	1	11	−1	1	1	1	12	53
8744.6	0.8678	2,*u*								1	12	<25
8745.0	0.8677	2,*g*	1	0	0	8	6	4	−4	1	12	34
8745.1	0.8467	1,*u*	1	2	0	2	2	3	−1	3	5	39
		1,*u*	1	2	0	2	−2	3	3	3	5	58
8747.2	0.8746	2,*g*								1	14	<25
8747.2	0.8746	2,*u*								1	14	<25
8747.8	0.8594	1,*u*								2	9	<25
8747.8	0.8594	1,*g*								2	9	<25
8748.1	0.8627	0,g^+	0	2	0	10	0	0	0	2	10	35
8749.1	0.8686	2,*g*	0	0	1	11	1	1	1	1	12	33
8750.6	0.8684	0,u^+	0	0	1	12	0	0	0	1	12	77
8752.4	0.8627	2,*g*	0	2	0	10	2	0	0	2	10	27
8752.8	0.8629	2,*u*	0	2	0	3	3	7	−1	2	10	41
8753.5	0.8685	2,*u*	0	0	1	12	2	0	0	1	12	67
8753.5	0.8678	2,*u*	1	0	0	5	−5	7	7	1	12	44
8754.1	0.8677	2,*g*	1	0	0	6	6	6	−4	1	12	31
		2,*g*	1	0	0	8	6	4	−4	1	12	34
8754.3	0.8467	1,*u*	1	2	0	2	0	3	1	3	5	54
8754.5	0.8629	0,u^+	0	2	0	3	1	7	−1	2	10	38
		0,u^+	0	2	0	5	1	5	−1	2	10	25
8756.0	0.8408	1,*u*	0	0	3	1	1	2	0	3	3	47
		1,*u*	0	0	3	1	−1	2	2	3	3	50
8760.4	0.8677	0,u^+	1	0	0	5	5	7	−5	1	12	32
8760.4	0.8677	0,g^-	1	0	0	8	−4	4	4	1	12	43
8760.8	0.8629	2,*u*								2	10	<25
8761.4	0.8677	0,u^-	1	0	0	7	−5	5	5	1	12	60
8761.8	0.8366	0,u^+	2	0	1	0	0	2	0	3	2	99
8762.9	0.8841	1,*u*								0	17	<25
8763.1	0.8841	1,*g*								0	17	<25
8764.1	0.8408	1,*u*	0	0	3	1	1	2	0	3	3	47
		1,*u*	0	0	3	1	−1	2	2	3	3	49
8764.8	0.8593	1,*u*	0	1	1	5	5	4	−4	2	9	42
8765.3	0.8677	2,*u*	1	0	0	9	5	3	−3	1	12	28
8765.5	0.8593	1,*g*	0	1	1	4	4	5	−3	2	9	26
		1,*g*	0	1	1	6	4	3	−3	2	9	28
8765.6	0.8840	1,*g*								0	17	<25
8766.5	0.8628	0,u^-	0	2	0	1	−1	9	1	2	10	27

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,u^-$	0	2	0	7	−1	3	1	2	10	33
8766.6	0.8840	$1,u$								0	17	<25
8769.9	0.8366	$2,u$	2	0	1	0	0	2	2	3	2	99
8771.7	0.8677	$2,g$	1	0	0	8	4	4	−2	1	12	32
8772.0	0.8628	$2,u$								2	10	<25
8772.4	0.8593	$1,u$	0	1	1	5	5	4	−4	2	9	49
8772.7	0.8677	$0,g^-$	1	0	0	6	−2	6	2	1	12	32
8774.3	0.8677	$0,u^-$	1	0	0	5	−5	7	5	1	12	32
8774.6	0.8677	$0,g^+$	1	0	0	8	4	4	−4	1	12	62
8775.4	0.8629	$0,g^-$	0	2	0	2	−2	8	2	2	10	50
		$0,g^-$	0	2	0	4	−2	6	2	2	10	34
8776.0	0.8593	$1,g$	0	1	1	6	4	3	−3	2	9	26
8776.4	0.8677	$0,u^+$	1	0	0	7	3	5	−3	1	12	29
8776.6	0.8630	$0,g^+$	0	2	0	2	2	8	−2	2	10	49
		$0,g^+$	0	2	0	2	0	8	0	2	10	30
8779.4	0.8630	$2,g$	0	2	0	2	−2	8	4	2	10	54
8780.2	0.8840	$1,u$								0	17	<25
8780.6	0.8467	$1,g$	1	2	0	1	1	4	0	3	5	48
		$1,g$	1	2	0	1	−1	4	2	3	5	47
8780.9	0.8593	$1,u$								2	9	<25
8781.3	0.8677	$2,g$								1	12	<25
8781.8	0.8677	$2,u$								1	12	<25
8783.0	0.8677	$2,u$								1	12	<25
8785.4	0.8630	$2,g$	0	2	0	2	2	8	0	2	10	47
8785.7	0.8593	$1,g$								2	9	<25
8786.6	0.8409	$1,g$	0	0	3	0	0	3	1	3	3	94
8787.9	0.8840	$1,g$								0	17	<25
8788.0	0.8629	$0,g^+$	0	2	0	0	0	10	0	2	10	26
8788.8	0.8840	$1,g$								0	17	<25
8788.9	0.8467	$1,g$	1	2	0	1	1	4	0	3	5	43
		$1,g$	1	2	0	1	−1	4	2	3	5	46
8790.7	0.8677	$2,g$	1	0	0	4	−4	8	6	1	12	26
8791.5	0.8677	$0,g^-$	1	0	0	8	−4	4	4	1	12	38
8792.3	0.8840	$1,u$								0	17	<25
8792.5	0.8676	$2,u$								1	12	<25
8794.2	0.8430	$0,u^+$	1	1	1	4	0	0	0	3	4	94
8794.3	0.8629	$2,g$	0	2	0	0	0	10	2	2	10	26
8794.3	0.8593	$1,u$	0	1	1	5	−3	4	4	2	9	40
8796.6	0.8430	$2,u$	1	1	1	4	2	0	0	3	4	95
8798.1	0.8676	$0,g^+$	1	0	0	8	2	4	−2	1	12	41
		$0,g^+$	1	0	0	8	0	4	0	1	12	31
8798.2	0.8677	$0,u^-$	1	0	0	5	−3	7	3	1	12	27
		$0,u^-$	1	0	0	9	−3	3	3	1	12	29
8799.2	0.8594	$1,g$	0	1	1	4	−4	5	5	2	9	65
8799.9	0.8676	$0,u^+$	1	0	0	9	3	3	−3	1	12	28
		$0,u^+$	1	0	0	9	1	3	−1	1	12	37
8804.3	0.8631	$0,u^+$	0	2	0	1	1	9	−1	2	10	75
8805.6	0.8677	$2,u$								1	12	<25
8805.8	0.8593	$1,u$	0	1	1	7	3	2	−2	2	9	47
8805.9	0.8592	$1,g$	0	1	1	4	4	5	−3	2	9	30
		$1,g$	0	1	1	6	4	3	−3	2	9	25
		$1,g$	0	1	1	8	2	1	−1	2	9	27
8807.2	0.8347	$1,g$	0	2	2	1	1	0	0	4	1	99
8807.7	0.8676	$0,u^+$	1	0	0	7	1	5	−1	1	12	41
8808.3	0.8677	$0,g^+$	1	0	0	6	4	6	−4	1	12	36
8808.7	0.8431	$0,g^+$	1	1	1	3	1	1	−1	3	4	96
8808.8	0.8677	$2,g$								1	12	<25
8810.4	0.8431	$2,g$	1	1	1	3	3	1	−1	3	4	83
8810.4	0.8593	$1,u$	0	1	1	7	1	2	0	2	9	38
8810.4	0.8593	$1,g$								2	9	<25
8810.6	0.8631	$2,u$	0	2	0	1	1	9	1	2	10	27
		$2,u$	0	2	0	1	−1	9	3	2	10	47
8810.8	0.8676	$2,g$	1	0	0	10	4	2	−2	1	12	32
8811.6	0.8593	$1,g$	0	1	1	8	0	1	1	2	9	34

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8811.9	0.8838	1,g	0	0	0	11	−5	6	6	0	17	56
8812.3	0.8630	0,u^-	0	2	0	1	−1	9	1	2	10	33
		0,u^-	0	2	0	3	−1	7	1	2	10	34
8813.3	0.8514	1,u	2	0	0	6	2	1	−1	2	7	58
		1,u	2	0	0	6	0	1	1	2	7	25
8814.3	0.8593	1,u	0	1	1	7	−1	2	2	2	9	53
8815.0	0.8514	1,g	2	0	0	5	1	2	0	2	7	36
		1,g	2	0	0	7	1	0	0	2	7	56
8815.1	0.8677	2,u	1	0	0	7	−1	5	3	1	12	30
8815.6	0.8745	0,u^+	0	1	0	5	3	9	−3	1	14	25
8815.7	0.8745	0,g^-								1	14	<25
8816.0	0.8838	1,u	0	0	0	12	6	5	−5	0	17	51
8816.0	0.8677	0,g^+								1	12	<25
8816.3	0.8677	0,u^-	1	0	0	9	−1	3	1	1	12	26
8816.3	0.8677	0,g^-	1	0	0	4	−4	8	4	1	12	34
8816.8	0.8840	1,g								0	17	<25
8816.9	0.8676	2,g	1	0	0	10	4	2	−2	1	12	29
8817.3	0.8839	1,u	0	0	0	10	−4	7	5	0	17	27
8819.2	0.8630	2,u	0	2	0	1	1	9	1	2	10	27
8820.0	0.8677	0,u^-	1	0	0	9	−3	3	3	1	12	34
8820.2	0.8675	0,g^+	1	0	0	10	2	2	−2	1	12	27
		0,g^+	1	0	0	10	0	2	0	1	12	38
8820.7	0.8431	0,g^-	1	1	1	3	−1	1	1	3	4	93
8821.4	0.8677	2,u	1	0	0	9	3	3	−1	1	12	26
8822.0	0.8677	2,g	1	0	0	10	2	2	0	1	12	34
8822.5	0.8514	1,g	2	0	0	5	3	2	−2	2	7	74
8823.0	0.8745	2,g								1	14	<25
8823.2	0.8745	2,u								1	14	<25
8823.3	0.8468	1,u	1	2	0	0	0	5	1	3	5	93
8823.3	0.8677	0,u^+	1	0	0	9	1	3	−1	1	12	37
8823.8	0.8593	1,g	0	1	1	6	−2	3	3	2	9	28
8824.3	0.8839	1,g	0	0	0	11	5	6	−4	0	17	46
8824.3	0.8431	2,g	1	1	1	3	1	1	1	3	4	78
8825.3	0.8514	1,u	2	0	0	6	0	1	1	2	7	43
8826.8	0.8677	2,g								1	12	<25
8827.4	0.8677	2,u	1	0	0	9	1	3	1	1	12	37
8828.3	0.8839	1,u	0	0	0	8	−4	9	5	0	17	28
8829.3	0.8677	0,g^-	1	0	0	6	−2	6	2	1	12	25
8829.5	0.8631	0,g^+	0	2	0	0	0	10	0	2	10	58
8831.5	0.8677	2,u	1	0	0	9	−1	3	3	1	12	38
8831.5	0.8593	1,g								2	9	<25
8831.9	0.8677	0,g^+								1	12	<25
8832.0	0.8515	1,g	2	0	0	5	−1	2	2	2	7	63
8834.0	0.8678	0,u^+	1	0	0	5	3	7	−3	1	12	27
		0,u^+	1	0	0	5	1	7	−1	1	12	49
8834.2	0.8304	0,g^+	2	2	0	0	0	0	0	4	0	99
8834.6	0.8431	0,u^+	1	1	1	2	2	2	−2	3	4	65
		0,u^+	1	1	1	2	0	2	0	3	4	32
8835.1	0.8594	1,u	0	1	1	3	−3	6	4	2	9	57
8835.3	0.8515	1,u	2	0	0	4	4	3	−3	2	7	94
8836.3	0.8631	2,g	0	2	0	0	0	10	2	2	10	59
8837.9	0.8677	2,g								1	12	<25
8838.1	0.8677	2,g								1	12	<25
8839.4	0.8678	2,u	1	0	0	5	−1	7	3	1	12	27
8839.9	0.8432	0,u^-	1	1	1	2	−2	2	2	3	4	99
8840.3	0.8532	1,u	0	3	0	6	2	1	−1	3	7	57
8840.7	0.8593	1,u	0	1	1	3	3	6	−2	2	9	36
8841.4	0.8515	1,g	2	0	0	5	1	2	0	2	7	25
		1,g	2	0	0	7	1	0	0	2	7	28
8841.7	0.8592	1,u	0	1	1	9	1	0	0	2	9	57
8842.4	0.8531	1,g	0	3	0	5	1	2	0	3	7	42
		1,g	0	3	0	7	1	0	0	3	7	45
8843.7	0.8431	2,u	1	1	1	2	2	2	0	3	4	66
		2,u	1	1	1	2	0	2	2	3	4	31

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8844.4	0.8348	1,*u*	0	2	2	0	0	1	1	4	1	99
8848.4	0.8515	1,*u*	2	0	0	4	−2	3	3	2	7	57
8848.4	0.8839	1,*g*								0	17	<25
8848.5	0.8532	1,*g*	0	3	0	5	3	2	−2	3	7	73
8848.7	0.8839	1,*u*								0	17	<25
8849.1	0.8432	$0,u^+$	1	1	1	2	2	2	−2	3	4	34
		$0,u^+$	1	1	1	2	0	2	0	3	4	58
8849.5	0.8592	1,*g*	0	1	1	8	0	1	1	2	9	37
8851.1	0.8675	$0,u^+$	1	0	0	11	1	1	−1	1	12	77
8851.3	0.8594	1,*u*								2	9	<25
8851.3	0.8532	1,*u*	0	3	0	6	0	1	1	3	7	41
8852.4	0.8675	2,*u*	1	0	0	11	3	1	−1	1	12	55
8853.5	0.8515	1,*u*	2	0	0	4	2	3	−1	2	7	35
		1,*u*	2	0	0	4	−2	3	3	2	7	28
8854.2	0.8432	2,*u*	1	1	1	2	2	2	0	3	4	29
		2,*u*	1	1	1	2	0	2	2	3	4	65
8854.9	0.8676	$0,g^-$	1	0	0	10	−2	2	2	1	12	50
8855.2	0.8679	$0,u^-$	1	0	0	3	−3	9	3	1	12	41
		$0,u^-$	1	0	0	5	−3	7	3	1	12	27
8855.7	0.8679	$0,g^+$	1	0	0	4	2	8	−2	1	12	42
8856.6	0.8842	1,*g*								0	17	<25
8857.7	0.8532	1,*g*	0	3	0	5	−1	2	2	3	7	65
8859.8	0.8533	1,*u*	0	3	0	4	4	3	−3	3	7	95
8860.1	0.8677	2,*g*								1	12	<25
8860.6	0.8862	$0,u^+$								0	18	<25
8860.6	0.8862	$0,g^-$								0	18	<25
8861.2	0.8745	$0,u^-$	0	1	0	7	−7	7	7	1	14	35
8862.1	0.8678	2,*u*								1	12	<25
8862.2	0.8842	1,*u*								0	17	<25
8862.4	0.8678	2,*g*								1	12	<25
8863.7	0.8839	1,*u*								0	17	<25
8864.6	0.8745	$0,g^+$	0	1	0	6	6	8	−6	1	14	32
8864.7	0.8515	1,*u*	2	0	0	6	0	1	1	2	7	26
8865.5	0.8841	1,*g*								0	17	<25
8865.5	0.8744	2,*g*	0	1	0	8	8	6	−6	1	14	46
8866.6	0.8593	1,*u*	0	1	1	7	1	2	0	2	9	25
8866.6	0.8595	1,*g*	0	1	1	2	0	7	1	2	9	26
		1,*g*	0	1	1	2	−2	7	3	2	9	39
8866.9	0.8677	$0,u^+$								1	12	<25
8867.2	0.8532	1,*g*	0	3	0	7	1	0	0	3	7	35
8867.8	0.8839	1,*g*								0	17	<25
8868.3	0.8839	1,*u*								0	17	<25
8868.4	0.8677	$0,g^+$	1	0	0	10	0	2	0	1	12	28
8868.6	0.8676	$0,u^-$	1	0	0	11	−1	1	1	1	12	35
8868.8	0.8862	2,*g*								0	18	<25
8868.8	0.8862	2,*u*								0	18	<25
8871.1	0.8516	1,*g*	2	0	0	3	−3	4	4	2	7	88
8871.3	0.8432	$0,g^+$	1	1	1	1	1	3	−1	3	4	96
8871.4	0.8745	2,*u*	0	1	0	7	7	7	−5	1	14	26
8872.0	0.8594	1,*g*	0	1	1	2	2	7	−1	2	9	35
8872.8	0.8533	1,*u*	0	3	0	4	−2	3	3	3	7	60
8873.1	0.8677	2,*u*								1	12	<25
8873.5	0.8516	1,*g*	2	0	0	3	3	4	−2	2	7	71
8874.3	0.8676	2,*g*								1	12	<25
8874.8	0.8677	2,*u*								1	12	<25
8875.4	0.8559	$0,u^-$	0	0	2	3	−1	5	1	2	8	42
		$0,u^-$	0	0	2	5	−1	3	1	2	8	27
8875.4	0.8559	$0,g^+$								2	8	<25
8876.4	0.8840	1,*u*								0	17	<25
8877.2	0.8840	1,*g*								0	17	<25
8877.6	0.8679	$0,u^+$	1	0	0	3	1	9	−1	1	12	40
8878.0	0.8533	1,*u*	0	3	0	4	2	3	−1	3	7	34
8879.3	0.8432	2,*g*	1	1	1	1	1	3	1	3	4	52
		2,*g*	1	1	1	1	−1	3	3	3	4	45

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8880.1	0.8839	1,u								0	17	<25
8880.4	0.8432	0,g^-	1	1	1	1	−1	3	1	3	4	93
8881.2	0.8559	2,u								2	8	<25
8881.2	0.8559	2,g								2	8	<25
8882.0	0.8839	1,u								0	17	<25
8882.5	0.8516	1,g	2	0	0	3	−1	4	2	2	7	41
8882.6	0.8745	0,u^-								1	14	<25
8884.1	0.8745	0,g^+								1	14	<25
8884.8	0.8679	2,u								1	12	<25
8885.5	0.8594	1,g	0	1	1	0	0	9	1	2	9	30
8885.9	0.8745	2,g	0	1	0	8	8	6	−6	1	14	25
8886.0	0.8745	0,u^+	0	1	0	7	7	7	−7	1	14	80
8886.2	0.8840	1,g								0	17	<25
8886.9	0.8432	2,g	1	1	1	1	1	3	1	3	4	42
		2,g	1	1	1	1	−1	3	3	3	4	54
8887.1	0.8558	2,u	0	0	2	5	5	3	−3	2	8	88
8887.9	0.8558	0,u^+	0	0	2	3	3	5	−3	2	8	25
8888.1	0.8558	0,g^-	0	0	2	4	−2	4	2	2	8	44
		0,g^-	0	0	2	6	−2	2	2	2	8	25
8889.1	0.8679	0,g^-	1	0	0	2	−2	10	2	1	12	33
		0,g^-	1	0	0	4	−2	8	2	1	12	33
8889.3	0.8558	2,g	0	0	2	4	4	4	−2	2	8	33
		2,g	0	0	2	6	4	2	−2	2	8	36
8889.3	0.8711	1,g								1	13	<25
8889.3	0.8711	1,u								1	13	<25
8889.5	0.8533	1,u	0	3	0	6	0	1	1	3	7	28
8890.7	0.8745	2,u								1	14	<25
8891.2	0.8371	0,g^+	1	3	0	2	0	0	0	4	2	99
8891.6	0.8840	1,g								0	17	<25
8891.8	0.8516	1,g								2	7	<25
8893.1	0.8558	0,g^+								2	8	<25
8893.6	0.8371	2,g	1	3	0	2	2	0	0	4	2	99
8893.6	0.8558	2,u	0	0	2	5	3	3	−1	2	8	32
8893.9	0.8596	1,u	0	1	1	1	1	8	0	2	9	32
		1,u	0	1	1	1	−1	8	2	2	9	39
8894.1	0.8534	1,g	0	3	0	3	−3	4	4	3	7	88
8894.9	0.8679	2,g	1	0	0	2	−2	10	4	1	12	30
8895.1	0.8838	1,g								0	17	<25
8895.2	0.8558	0,u^-	0	0	2	3	−3	5	3	2	8	29
		0,u^-	0	0	2	5	−3	3	3	2	8	57
8895.5	0.8675	0,g^+	1	0	0	12	0	0	0	1	12	69
8895.6	0.8745	2,g								1	14	<25
8896.6	0.8558	0,u^+	0	0	2	5	3	3	−3	2	8	37
		0,u^+	0	0	2	5	1	3	−1	2	8	39
8896.8	0.8533	1,g	0	3	0	3	3	4	−2	3	7	70
8896.9	0.8680	0,g^+	1	0	0	2	2	10	−2	1	12	40
8898.5	0.8676	0,u^-	1	0	0	11	−1	1	1	1	12	55
8898.6	0.8674	2,g	1	0	0	12	2	0	0	1	12	77
8899.2	0.8838	1,u								0	17	<25
8899.5	0.8558	2,g								2	8	<25
8900.5	0.8559	0,g^-	0	0	2	4	−4	4	4	2	8	84
8900.8	0.8558	0,g^+	0	0	2	4	4	4	−4	2	8	75
8901.2	0.8840	1,u								0	17	<25
8903.4	0.8676	2,u	1	0	0	11	1	1	1	1	12	36
8903.9	0.8838	1,g								0	17	<25
8904.7	0.8680	2,g	1	0	0	2	2	10	0	1	12	36
		2,g	1	0	0	2	0	10	2	1	12	26
8905.8	0.8533	1,g	0	3	0	3	−1	4	2	3	7	40
8905.8	0.8745	0,g^-	0	1	0	6	−6	8	6	1	14	38
		0,g^-	0	1	0	8	−6	6	6	1	14	31
8907.9	0.8594	1,u								2	9	<25
8908.3	0.8558	2,u	0	0	2	5	−1	3	3	2	8	37
8909.8	0.8676	0,g^+								1	12	<25
8910.0	0.8517	1,u	2	0	0	2	0	5	1	2	7	27

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		1,u	2	0	0	2	−2	5	3	2	7	45
8911.2	0.8745	0,u^-	0	1	0	7	−7	7	7	1	14	52
8911.6	0.8433	0,u^+	1	1	1	0	0	4	0	3	4	94
8913.4	0.8516	1,u	2	0	0	2	2	5	−1	2	7	48
		1,u	2	0	0	2	−2	5	3	2	7	34
8913.5	0.8745	2,u								1	14	<25
8915.4	0.8533	1,g								3	7	<25
8915.5	0.8677	2,g								1	12	<25
8915.7	0.8842	1,u	0	0	0	0	0	17	1	0	17	38
8916.8	0.8837	1,g								0	17	<25
8917.7	0.8681	0,u^+	1	0	0	1	1	11	−1	1	12	67
8919.2	0.8433	2,u	1	1	1	0	0	4	2	3	4	96
8919.3	0.8558	2,g	0	0	2	4	4	4	−2	2	8	36
		2,g	0	0	2	6	4	2	−2	2	8	29
8919.8	0.8559	2,g	0	0	2	4	−2	4	4	2	8	50
8920.2	0.8596	1,g	0	1	1	0	0	9	1	2	9	52
8920.9	0.8557	0,u^+	0	0	2	7	1	1	−1	2	8	69
8921.3	0.8396	1,g	1	0	2	3	1	0	0	3	3	96
8921.8	0.8558	0,g^+								2	8	<25
8922.3	0.8557	2,u	0	0	2	7	3	1	−1	2	8	57
8922.5	0.8516	1,u	2	0	0	2	0	5	1	2	7	36
8922.6	0.8745	2,g	0	1	0	6	−6	8	8	1	14	41
8922.9	0.8840	1,u								0	17	<25
8924.1	0.8680	2,u	1	0	0	1	1	11	1	1	12	30
		2,u	1	0	0	1	−1	11	3	1	12	35
8925.0	0.8863	0,u^-								0	18	<25
8925.0	0.8863	0,g^+								0	18	<25
8926.3	0.8678	0,u^-								1	12	<25
8927.8	0.8558	0,g^+	0	0	2	6	2	2	−2	2	8	28
8928.1	0.8558	0,g^-	0	0	2	2	−2	6	2	2	8	33
		0,g^-	0	0	2	6	−2	2	2	2	8	62
8928.2	0.8371	0,u^+	1	3	0	1	1	1	−1	4	2	99
8928.3	0.8558	0,u^-	0	0	2	1	−1	7	1	2	8	25
		0,u^-	0	0	2	7	−1	1	1	2	8	42
8929.1	0.8839	1,g								0	17	<25
8930.4	0.8558	2,g	0	0	2	2	2	6	0	2	8	26
		2,g	0	0	2	6	2	2	0	2	8	32
8930.7	0.8745	0,u^+								1	14	<25
8930.9	0.8559	2,u	0	0	2	3	−3	5	5	2	8	84
8931.5	0.8838	1,u								0	17	<25
8931.6	0.8534	1,u	0	3	0	2	0	5	1	3	7	27
		1,u	0	3	0	2	−2	5	3	3	7	45
8931.8	0.8559	0,u^+	0	0	2	3	3	5	−3	2	8	50
		0,u^+	0	0	2	3	1	5	−1	2	8	26
8933.0	0.8745	0,g^-								1	14	<25
8933.1	0.8863	2,g								0	18	<25
8933.2	0.8863	2,u								0	18	<25
8933.4	0.8840	1,g								0	17	<25
8933.4	0.8559	0,u^-	0	0	2	3	−3	5	3	2	8	60
		0,u^-	0	0	2	5	−3	3	3	2	8	33
8933.6	0.8678	2,u								1	12	<25
8934.0	0.8558	2,u	0	0	2	7	1	1	1	2	8	40
8935.4	0.8534	1,u	0	3	0	2	2	5	−1	3	7	48
		1,u	0	3	0	2	−2	5	3	3	7	33
8935.4	0.8371	0,u^-	1	3	0	1	−1	1	1	4	2	99
8936.2	0.8744	2,u	0	1	0	9	7	5	−5	1	14	32
8936.8	0.8680	0,g^+	1	0	0	0	0	12	0	1	12	38
8936.9	0.8558	2,g	0	0	2	6	0	2	2	2	8	54
8938.3	0.8745	2,g								1	14	<25
8938.4	0.8837	1,u	0	0	0	12	−2	5	3	0	17	34
8938.5	0.8371	2,u	1	3	0	1	1	1	1	4	2	99
8939.2	0.8396	1,u	1	0	2	2	2	1	−1	3	3	70
		1,u	1	0	2	2	0	1	1	3	3	29
8941.9	0.8744	0,g^+	0	1	0	8	6	6	−6	1	14	69

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8943.6	0.8844	1,g	0	0	0	1	1	16	0	0	17	38
		1,g	0	0	0	1	−1	16	2	0	17	34
8943.8	0.8680	2,g	1	0	0	0	0	12	2	1	12	38
8944.2	0.8559	2,u	0	0	2	3	3	5	−1	2	8	28
8944.8	0.8534	1,u	0	3	0	2	0	5	1	3	7	33
8946.8	0.8558	0,u^+	0	0	2	5	1	3	−1	2	8	31
8947.4	0.8744	2,u	0	1	0	9	7	5	−5	1	14	38
8948.3	0.8517	1,g	2	0	0	1	1	6	0	2	7	41
		1,g	2	0	0	1	−1	6	2	2	7	49
8949.4	0.8396	1,u	1	0	2	2	2	1	−1	3	3	29
		1,u	1	0	2	2	0	1	1	3	3	67
8950.9	0.8557	0,g^+	0	0	2	8	0	0	0	2	8	69
8951.2	0.8559	2,u	0	0	2	5	−1	3	3	2	8	30
8952.1	0.8313	0,u^+	0	1	3	0	0	0	0	4	0	98
8953.4	0.8837	1,g	0	0	0	13	−3	4	4	0	17	57
8954.1	0.8557	2,g	0	0	2	8	2	0	0	2	8	66
8954.6	0.8840	1,u								0	17	<25
8954.9	0.8711	1,u								1	13	<25
8955.0	0.8711	1,g								1	13	<25
8955.2	0.8517	1,g	2	0	0	1	1	6	0	2	7	39
		1,g	2	0	0	1	−1	6	2	2	7	34
8955.8	0.8582	1,g								2	9	<25
8955.8	0.8582	1,u								2	9	<25
8956.7	0.8745	0,u^+	0	1	0	5	5	9	−5	1	14	36
8957.1	0.8560	0,g^+	0	0	2	2	2	6	−2	2	8	49
8957.4	0.8744	0,g^-	0	1	0	8	−6	6	6	1	14	53
8958.1	0.8839	1,g								0	17	<25
8959.2	0.8744	0,u^-	0	1	0	9	−5	5	5	1	14	32
8959.5	0.8745	0,g^+	0	1	0	6	6	8	−6	1	14	50
8961.8	0.8840	1,u								0	17	<25
8961.9	0.8745	2,u	0	1	0	7	−5	7	7	1	14	25
8961.9	0.8560	2,g	0	0	2	2	−2	6	4	2	8	51
8963.0	0.8558	0,u^-	0	0	2	1	−1	7	1	2	8	30
		0,u^-	0	0	2	7	−1	1	1	2	8	48
8965.1	0.8745	2,g	0	1	0	6	6	8	−4	1	14	26
8965.2	0.8559	0,g^-	0	0	2	2	−2	6	2	2	8	48
		0,g^-	0	0	2	4	−2	4	2	2	8	38
8965.9	0.8840	1,u								0	17	<25
8966.0	0.8745	2,g								1	14	<25
8967.4	0.8582	1,g	1	1	0	5	5	4	−4	2	9	38
8967.7	0.8558	2,u	0	0	2	7	1	1	1	2	8	33
8968.1	0.8582	1,u	1	1	0	6	4	3	−3	2	9	41
8968.5	0.8535	1,g	0	3	0	1	1	6	0	3	7	41
		1,g	0	3	0	1	−1	6	2	3	7	49
8971.0	0.8397	1,g	1	0	2	1	1	2	0	3	3	51
		1,g	1	0	2	1	−1	2	2	3	3	46
8971.5	0.8559	2,g	0	0	2	2	2	6	0	2	8	31
8971.9	0.8497	0,g^+	0	2	1	5	1	1	−1	3	6	85
8972.0	0.8497	0,u^+	0	2	1	4	0	2	0	3	6	32
		0,u^+	0	2	1	6	0	0	0	3	6	63
8972.5	0.8839	1,g	0	0	0	13	3	4	−2	0	17	28
8973.1	0.8497	2,g	0	2	1	5	3	1	−1	3	6	72
8973.7	0.8862	0,u^-								0	18	<25
8974.7	0.8497	2,u	0	2	1	4	2	2	0	3	6	30
		2,u	0	2	1	6	2	0	0	3	6	64
8974.7	0.8745	2,u	0	1	0	5	−5	9	7	1	14	36
8974.8	0.8862	0,g^+								0	18	<25
8975.2	0.8582	1,g	1	1	0	5	5	4	−4	2	9	44
8975.7	0.8581	1,u	1	1	0	6	2	3	−1	2	9	32
8976.0	0.8535	1,g	0	3	0	1	1	6	0	3	7	38
		1,g	0	3	0	1	−1	6	2	3	7	33
8976.4	0.8353	0,g^+	3	0	0	2	0	0	0	3	2	99
8977.6	0.8839	1,g	0	0	0	13	−1	4	2	0	17	26
8977.9	0.8372	0,g^+	1	3	0	0	0	2	0	4	2	99

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8978.1	0.8581	1,g	1	1	0	7	1	2	0	2	9	26
8978.7	0.8353	2,g	3	0	0	2	2	0	0	3	2	99
8979.0	0.8559	0,g^+	0	0	2	0	0	8	0	2	8	34
8979.1	0.8397	1,g	1	0	2	1	1	2	0	3	3	45
		1,g	1	0	2	1	−1	2	2	3	3	52
8980.2	0.8839	1,u	0	0	0	14	4	3	−3	0	17	32
8981.5	0.8862	2,g								0	18	<25
8981.6	0.8498	2,u	0	2	1	4	4	2	−2	3	6	89
8982.2	0.8560	0,u^+	0	0	2	1	1	7	−1	2	8	67
8982.5	0.8862	2,u								0	18	<25
8982.9	0.8745	0,g^+	0	1	0	8	4	6	−4	1	14	32
8983.3	0.8497	0,g^-	0	2	1	3	−1	3	1	3	6	30
		0,g^-	0	2	1	5	−1	1	1	3	6	66
8984.3	0.8559	2,g	0	0	2	0	0	8	2	2	8	33
8984.5	0.8498	0,u^+	0	2	1	4	2	2	−2	3	6	70
8985.8	0.8582	1,u	1	1	0	6	−2	3	3	2	9	35
8985.8	0.8518	1,u	2	0	0	0	0	7	1	2	7	85
8986.0	0.8372	2,g	1	3	0	0	0	2	2	4	2	99
8986.6	0.8744	0,u^+	0	1	0	9	5	5	−5	1	14	54
8987.8	0.8497	2,g	0	2	1	5	1	1	1	3	6	58
8988.4	0.8560	2,u	0	0	2	1	1	7	1	2	8	26
		2,u	0	0	2	1	−1	7	3	2	8	43
8989.0	0.8498	0,u^-	0	2	1	4	−2	2	2	3	6	87
8990.7	0.8838	1,u	0	0	0	14	4	3	−3	0	17	37
8991.3	0.8745	0,u^-	0	1	0	9	−1	5	1	1	14	25
8992.9	0.8745	2,g								1	14	<25
8993.2	0.8745	2,u								1	14	<25
8994.0	0.8710	1,u	0	0	1	7	7	6	−6	1	13	39
8995.3	0.8839	1,g								0	17	<25
8995.9	0.8498	2,u	0	2	1	4	2	2	0	3	6	26
		2,u	0	2	1	4	0	2	2	3	6	48
8996.3	0.8710	1,g								1	13	<25
8996.3	0.8745	0,g^+								1	14	<25
8997.2	0.8582	1,g	1	1	0	5	−3	4	4	2	9	59
8997.5	0.8743	2,g	0	1	0	10	6	4	−4	1	14	47
8997.8	0.8581	1,u	1	1	0	8	2	1	−1	2	9	45
8999.9	0.8559	0,u^-	0	0	2	1	−1	7	1	2	8	30
		0,u^-	0	0	2	3	−1	5	1	2	8	37
9000.6	0.8498	0,u^+	0	2	1	4	0	2	0	3	6	34
9001.7	0.8744	0,u^-	0	1	0	7	−5	7	5	1	14	27
		0,u^-	0	1	0	9	−5	5	5	1	14	53
9002.2	0.8744	2,g	0	1	0	10	6	4	−4	1	14	26
9002.2	0.8498	0,g^+	0	2	1	3	3	3	−3	3	6	78
9002.5	0.8745	2,u								1	14	<25
9003.8	0.8498	0,g^-	0	2	1	3	−3	3	3	3	6	96
9004.2	0.8836	1,g	0	0	0	13	1	4	0	0	17	37
9004.6	0.8581	1,g	1	1	0	7	3	2	−2	2	9	39
9004.7	0.8536	1,u	0	3	0	0	0	7	1	3	7	84
9005.1	0.8498	2,u	0	2	1	4	0	2	2	3	6	32
9005.7	0.8559	2,u								2	8	<25
9005.9	0.8744	0,u^+	0	1	0	7	5	7	−5	1	14	37
9006.6	0.8581	1,g	1	1	0	9	1	0	0	2	9	39
9007.0	0.8583	1,u	1	1	0	4	−4	5	5	2	9	82
9008.0	0.8437	0,g^+	0	4	0	4	0	0	0	4	4	96
9008.3	0.8398	1,u	1	0	2	0	0	3	1	3	3	96
9008.6	0.8560	0,g^+	0	0	2	0	0	8	0	2	8	46
		0,g^+	0	0	2	2	0	6	0	2	8	25
9009.0	0.8839	1,u								0	17	<25
9009.6	0.8581	1,u	1	1	0	8	0	1	1	2	9	40
9010.3	0.8437	2,g	0	4	0	4	2	0	0	4	4	97
9011.7	0.8498	2,g	0	2	1	3	3	3	−1	3	6	61
9012.7	0.8498	0,g^+	0	2	1	3	1	3	−1	3	6	57
9013.2	0.8744	0,g^-	0	1	0	8	−4	6	4	1	14	29
9013.6	0.8582	1,g	1	1	0	7	−1	2	2	2	9	42

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9014.3	0.8710	1,u	0	0	1	7	7	6	−6	1	13	32
9014.6	0.8582	1,u	1	1	0	4	4	5	−3	2	9	61
9014.9	0.8354	0,u^+	3	0	0	1	1	1	−1	3	2	99
9015.0	0.8561	2,g	0	0	2	0	0	8	2	2	8	48
9015.5	0.8745	0,u^-	0	1	0	7	−3	7	3	1	14	33
9015.5	0.8745	0,g^-	0	1	0	6	−4	8	4	1	14	39
9015.8	0.8839	1,g								0	17	<25
9016.3	0.8861	0,u^+	0	0	0	9	9	9	−9	0	18	34
9017.8	0.8711	1,g								1	13	<25
9018.1	0.8744	2,u	0	1	0	9	5	5	−3	1	14	31
9018.4	0.8836	1,u	0	0	0	14	−2	3	3	0	17	58
9018.9	0.8499	2,g	0	2	1	3	−1	3	3	3	6	68
9021.0	0.8710	1,u								1	13	<25
9021.2	0.8745	2,g	0	1	0	6	−4	8	6	1	14	32
9022.1	0.8354	0,u^-	3	0	0	1	−1	1	1	3	2	99
9022.8	0.8862	0,g^-								0	18	<25
9023.5	0.8498	0,g^-	0	2	1	3	−1	3	1	3	6	44
		0,g^-	0	2	1	5	−1	1	1	3	6	32
9023.9	0.8710	1,g	0	0	1	6	−6	7	7	1	13	49
9023.9	0.8745	2,u								1	14	<25
9024.1	0.8745	2,g								1	14	<25
9024.2	0.8861	2,g								0	18	<25
9025.0	0.8744	0,u^+	0	1	0	9	3	5	−3	1	14	49
9025.2	0.8354	2,u	3	0	0	1	1	1	1	3	2	99
9027.3	0.8581	1,g	1	1	0	9	1	0	0	2	9	46
9027.8	0.8438	0,u^+	0	4	0	3	1	1	−1	4	4	98
9027.9	0.8836	1,u	0	0	0	14	2	3	−1	0	17	29
9028.5	0.8498	2,g	0	2	1	3	1	3	1	3	6	34
9028.5	0.8744	0,g^+	0	1	0	10	4	4	−4	1	14	49
9029.1	0.8438	2,u	0	4	0	3	3	1	−1	4	4	84
9031.0	0.8862	2,u								0	18	<25
9031.2	0.8583	1,u	1	1	0	4	−2	5	3	2	9	35
9033.2	0.8744	2,g								1	14	<25
9034.1	0.8499	0,u^+	0	2	1	2	2	4	−2	3	6	62
		0,u^+	0	2	1	2	0	4	0	3	6	29
9034.3	0.8336	1,u	1	2	1	1	1	0	0	4	1	99
9034.4	0.8582	1,u								2	9	<25
9034.6	0.8744	2,u	0	1	0	9	−3	5	5	1	14	29
9034.7	0.8745	0,g^-	0	1	0	8	−2	6	2	1	14	27
9036.2	0.8745	0,u^-								1	14	<25
9039.5	0.8499	0,u^-	0	2	1	2	−2	4	2	3	6	87
9039.8	0.8743	0,g^+								1	14	<25
9039.9	0.8744	2,u								1	14	<25
9040.0	0.8438	0,u^-	0	4	0	3	−1	1	1	4	4	96
9041.3	0.8499	2,u	0	2	1	2	0	4	2	3	6	26
		2,u	0	2	1	2	−2	4	4	3	6	54
9042.7	0.8419	0,g^+	2	1	0	4	0	0	0	3	4	96
9043.4	0.8743	0,g^-	0	1	0	10	−4	4	4	1	14	50
		0,g^-	0	1	0	10	−2	4	2	1	14	27
9043.5	0.8438	2,u	0	4	0	3	1	1	1	4	4	80
9045.0	0.8419	2,g	2	1	0	4	2	0	0	3	4	97
9045.8	0.8499	2,u	0	2	1	2	2	4	0	3	6	44
		2,u	0	2	1	2	−2	4	4	3	6	39
9046.7	0.8745	2,g								1	14	<25
9047.2	0.8582	1,u								2	9	<25
9048.1	0.8583	1,g	1	1	0	3	−3	6	4	2	9	69
9049.5	0.8710	1,u								1	13	<25
9049.6	0.8499	0,u^+	0	2	1	2	0	4	0	3	6	35
9049.7	0.8745	0,u^-	0	1	0	9	−3	5	3	1	14	36
9050.4	0.8743	2,u	0	1	0	9	−1	5	3	1	14	25
9051.2	0.8743	2,u	0	1	0	11	5	3	−3	1	14	37
9051.6	0.8744	2,g								1	14	<25
9051.7	0.8835	1,g	0	0	0	15	3	2	−2	0	17	62
9051.9	0.8835	1,u	0	0	0	14	0	3	1	0	17	52

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9051.9	0.8710	1,*g*								1	13	<25
9052.7	0.8583	1,*g*	1	1	0	3	3	6	−2	2	9	58
9055.2	0.8499	2,*u*	0	2	1	2	0	4	2	3	6	38
9056.1	0.8743	$0,u^+$	0	1	0	9	1	5	−1	1	14	55
9056.8	0.8861	$0,u^+$	0	0	0	9	9	9	−9	0	18	31
9057.1	0.8861	2,*g*	0	0	0	10	10	8	−8	0	18	46
9057.7	0.8861	$0,u^-$	0	0	0	9	−9	9	9	0	18	68
9058.7	0.8438	$0,g^+$	0	4	0	2	2	2	−2	4	4	65
		$0,g^+$	0	4	0	2	0	2	0	4	4	34
9059.3	0.8710	1,*g*								1	13	<25
9061.3	0.8710	1,*u*								1	13	<25
9061.3	0.8746	$0,g^-$	0	1	0	4	−4	10	4	1	14	27
9062.4	0.8583	1,*g*	1	1	0	3	−1	6	2	2	9	29
9063.9	0.8420	$0,u^+$	2	1	0	3	1	1	−1	3	4	97
9064.1	0.8438	$0,g^-$	0	4	0	2	−2	2	2	4	4	100
9065.3	0.8420	2,*u*	2	1	0	3	3	1	−1	3	4	83
9066.2	0.8355	$0,g^+$	3	0	0	0	0	2	0	3	2	99
9067.7	0.8438	2,*g*	0	4	0	2	2	2	0	4	4	69
		2,*g*	0	4	0	2	0	2	2	4	4	29
9067.7	0.8862	$0,g^-$	0	0	0	8	−8	10	8	0	18	32
9068.0	0.8500	$0,g^+$	0	2	1	1	1	5	−1	3	6	90
9068.1	0.8744	$0,g^+$	0	1	0	10	2	4	−2	1	14	40
9068.2	0.8744	2,*u*								1	14	<25
9068.4	0.8743	$0,u^+$	0	1	0	7	3	7	−3	1	14	26
		$0,u^+$	0	1	0	11	3	3	−3	1	14	33
9069.1	0.8709	1,*g*	0	0	1	8	6	5	−5	1	13	47
9070.0	0.8834	1,*g*	0	0	0	15	−1	2	2	0	17	56
9070.0	0.8745	2,*g*								1	14	<25
9070.9	0.8582	1,*g*								2	9	<25
9071.0	0.8744	$0,g^+$	0	1	0	8	2	6	−2	1	14	31
		$0,g^+$	0	1	0	8	0	6	0	1	14	33
9072.8	0.8745	$0,u^-$								1	14	<25
9073.4	0.8438	$0,g^+$	0	4	0	2	2	2	−2	4	4	35
		$0,g^+$	0	4	0	2	0	2	0	4	4	59
9073.7	0.8861	2,*u*								0	18	<25
9073.8	0.8861	2,*g*	0	0	0	8	−8	10	10	0	18	42
9074.4	0.8355	2,*g*	3	0	0	0	0	2	2	3	2	99
9074.4	0.8743	2,*g*								1	14	<25
9075.1	0.8500	2,*g*	0	2	1	1	1	5	1	3	6	39
		2,*g*	0	2	1	1	−1	5	3	3	6	53
9075.7	0.8548	$0,u^+$	1	0	1	4	0	4	0	2	8	26
9075.8	0.8710	1,*u*	0	0	1	7	−5	6	6	1	13	35
9075.8	0.8548	$0,g^-$	1	0	1	3	−1	5	1	2	8	33
		$0,g^-$	1	0	1	5	−1	3	1	2	8	37
9076.1	0.8743	$0,g^+$	0	1	0	10	0	4	0	1	14	57
9076.3	0.8420	$0,u^-$	2	1	0	3	−1	1	1	3	4	95
9077.6	0.8500	$0,g^-$	0	2	1	1	−1	5	1	3	6	75
9077.7	0.8744	2,*u*								1	14	<25
9078.1	0.8547	2,*u*	1	0	1	4	4	4	−2	2	8	30
		2,*u*	1	0	1	6	4	2	−2	2	8	52
9078.1	0.8547	2,*g*	1	0	1	5	5	3	−3	2	8	54
9078.2	0.8337	1,*g*	1	2	1	0	0	1	1	4	1	99
9078.4	0.8744	2,*g*								1	14	<25
9078.6	0.8438	2,*g*	0	4	0	2	2	2	0	4	4	28
		2,*g*	0	4	0	2	0	2	2	4	4	68
9078.7	0.8743	$0,u^+$	0	1	0	7	1	7	−1	1	14	40
9079.8	0.8420	2,*u*	2	1	0	3	1	1	1	3	4	80
9080.0	0.8744	2,*u*								1	14	<25
9080.4	0.8743	$0,u^-$	0	1	0	11	−3	3	3	1	14	55
9080.5	0.8547	2,*g*	1	0	1	5	5	3	−3	2	8	44
		2,*g*	1	0	1	5	3	3	−1	2	8	31
9082.1	0.8547	2,*u*	1	0	1	6	2	2	0	2	8	38
9082.1	0.8547	$0,g^+$	1	0	1	5	1	3	−1	2	8	34
		$0,g^+$	1	0	1	7	1	1	−1	2	8	35

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9083.9	0.8744	$2,g$								1	14	<25
9083.9	0.8500	$2,g$	0	2	1	1	1	5	1	3	6	43
		$2,g$	0	2	1	1	−1	5	3	3	6	35
9084.2	0.8547	$0,u^+$	1	0	1	6	2	2	−2	2	8	41
		$0,u^+$	1	0	1	6	0	2	0	2	8	30
9084.2	0.8547	$0,u^-$	1	0	1	4	−2	4	2	2	8	38
		$0,u^-$	1	0	1	6	−2	2	2	2	8	45
9084.4	0.8862	$0,g^+$								0	18	<25
9084.6	0.8744	$0,g^-$	0	1	0	10	−2	4	2	1	14	44
9085.1	0.8743	$0,u^+$	0	1	0	11	1	3	−1	1	14	38
9086.7	0.8584	$1,u$	1	1	0	2	−2	7	3	2	9	64
9086.8	0.8547	$2,g$	1	0	1	5	1	3	1	2	8	31
9087.4	0.8745	$0,g^+$	0	1	0	6	2	8	−2	1	14	44
		$0,g^+$	0	1	0	6	0	8	0	1	14	39
9088.7	0.8700	$1,u$								1	13	<25
9088.8	0.8700	$1,g$								1	13	<25
9089.1	0.8584	$1,u$	1	1	0	2	2	7	−1	2	9	58
9090.1	0.8745	$0,u^-$								1	14	<25
9090.5	0.8744	$2,g$								1	14	<25
9090.5	0.8547	$0,g^+$	1	0	1	5	3	3	−3	2	8	62
9091.0	0.8710	$1,g$								1	13	<25
9091.1	0.8547	$0,g^-$	1	0	1	5	−3	3	3	2	8	69
9091.6	0.8744	$2,u$	0	1	0	7	−1	7	3	1	14	29
9091.9	0.8710	$1,u$								1	13	<25
9093.3	0.8862	$2,u$								0	18	<25
9094.3	0.8547	$2,u$	1	0	1	4	0	4	2	2	8	26
		$2,u$	1	0	1	6	0	2	2	2	8	39
9094.3	0.8744	$2,u$								1	14	<25
9094.9	0.8650	$1,u$								2	11	<25
9094.9	0.8650	$1,g$								2	11	<25
9096.0	0.8862	$0,u^-$								0	18	<25
9096.3	0.8421	$0,g^+$	2	1	0	2	2	2	−2	3	4	64
		$0,g^+$	2	1	0	2	0	2	0	3	4	34
9096.7	0.8744	$2,g$	0	1	0	6	0	8	2	1	14	32
9097.4	0.8462	$1,g$	0	1	2	5	1	0	0	3	5	76
9098.0	0.8583	$1,u$	1	1	0	4	0	5	1	2	9	25
9099.2	0.8463	$1,u$	0	1	2	4	2	1	−1	3	5	61
		$1,u$	0	1	2	4	0	1	1	3	5	29
9099.4	0.8548	$0,u^+$	1	0	1	4	4	4	−4	2	8	90
9099.5	0.8548	$0,u^-$	1	0	1	4	−4	4	4	2	8	89
9100.1	0.8710	$1,g$								1	13	<25
9100.2	0.8746	$0,u^+$	0	1	0	5	1	9	−1	1	14	65
9100.7	0.8710	$1,u$								1	13	<25
9100.7	0.8439	$0,u^+$	0	4	0	1	1	3	−1	4	4	98
9101.7	0.8421	$0,g^-$	2	1	0	2	−2	2	2	3	4	99
9101.8	0.8743	$2,u$								1	14	<25
9102.0	0.8834	$1,g$	0	0	0	15	1	2	0	0	17	54
		$1,g$	0	0	0	15	−1	2	2	0	17	32
9102.6	0.8501	$0,u^+$	0	2	1	0	0	6	0	3	6	85
9103.0	0.8862	$2,g$								0	18	<25
9105.3	0.8742	$2,g$	0	1	0	12	4	2	−2	1	14	47
9105.3	0.8421	$2,g$	2	1	0	2	2	2	0	3	4	69
		$2,g$	2	1	0	2	0	2	2	3	4	29
9105.6	0.8547	$2,g$	1	0	1	5	−1	3	3	2	8	53
9108.0	0.8546	$0,g^+$	1	0	1	7	1	1	−1	2	8	57
9108.4	0.8741	$0,g^+$	0	1	0	12	2	2	−2	1	14	56
		$0,g^+$	0	1	0	12	0	2	0	1	14	35
9108.6	0.8746	$2,u$	0	1	0	5	1	9	1	1	14	34
		$2,u$	0	1	0	5	−1	9	3	1	14	28
9108.9	0.8439	$2,u$	0	4	0	1	1	3	1	4	4	56
		$2,u$	0	4	0	1	−1	3	3	4	4	42
9109.0	0.8546	$2,g$	1	0	1	7	3	1	−1	2	8	44
9109.5	0.8439	$0,u^-$	0	4	0	1	−1	3	1	4	4	96
9109.8	0.8501	$2,u$	0	2	1	0	0	6	2	3	6	87

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9110.3	0.8862	$0,u^+$	0	0	0	7	7	11	−7	0	18	40
		$0,u^+$	0	0	0	9	9	9	−9	0	18	27
9110.8	0.8862	$0,g^+$	0	0	0	8	8	10	−8	0	18	27
9111.1	0.8421	$0,g^+$	2	1	0	2	2	2	−2	3	4	35
		$0,g^+$	2	1	0	2	0	2	0	3	4	59
9111.5	0.8463	$1,u$	0	1	2	4	2	1	−1	3	5	25
		$1,u$	0	1	2	4	0	1	1	3	5	52
9112.1	0.8710	$1,u$								1	13	<25
9112.5	0.8747	$0,g^+$	0	1	0	4	2	10	−2	1	14	39
		$0,g^+$	0	1	0	4	0	10	0	1	14	30
9112.7	0.8463	$1,g$	0	1	2	3	3	2	−2	3	5	77
9113.3	0.8710	$1,g$								1	13	<25
9113.3	0.8546	$0,u^+$	1	0	1	8	0	0	0	2	8	69
9113.6	0.8834	$1,u$	0	0	0	16	2	1	−1	0	17	60
		$1,u$	0	0	0	16	0	1	1	0	17	32
9114.2	0.8547	$2,u$	1	0	1	4	4	4	−2	2	8	62
9115.5	0.8708	$1,u$	0	0	1	9	5	4	−4	1	13	62
9116.0	0.8546	$2,u$	1	0	1	8	2	0	0	2	8	71
9116.2	0.8421	$2,g$	2	1	0	2	2	2	0	3	4	27
		$2,g$	2	1	0	2	0	2	2	3	4	68
9116.3	0.8439	$2,u$	0	4	0	1	1	3	1	4	4	40
		$2,u$	0	4	0	1	−1	3	3	4	4	58
9117.2	0.8743	$0,u^+$	0	1	0	11	1	3	−1	1	14	30
9118.0	0.8745	$0,g^-$	0	1	0	4	−2	10	2	1	14	26
9118.2	0.8709	$1,g$	0	0	1	8	−4	5	5	1	13	31
9118.2	0.8862	$2,u$								0	18	<25
9118.9	0.8547	$0,u^+$	1	0	1	4	2	4	−2	2	8	34
9119.6	0.8746	$2,g$	0	1	0	4	0	10	2	1	14	29
9119.9	0.8862	$2,g$								0	18	<25
9120.1	0.8463	$1,g$	0	1	2	3	−1	2	2	3	5	60
9120.2	0.8547	$0,g^-$	1	0	1	7	−1	1	1	2	8	64
9120.5	0.8585	$1,g$	1	1	0	1	1	8	0	2	9	34
		$1,g$	1	1	0	1	−1	8	2	2	9	48
9120.9	0.8548	$2,u$	1	0	1	4	−2	4	4	2	8	71
9123.2	0.8743	$2,u$	0	1	0	11	3	3	−1	1	14	26
9123.6	0.8748	$0,u^+$	0	1	0	1	1	13	−1	1	14	29
		$0,u^+$	0	1	0	3	1	11	−1	1	14	37
9123.6	0.8547	$0,u^-$	1	0	1	2	−2	6	2	2	8	26
		$0,u^-$	1	0	1	6	−2	2	2	2	8	49
9124.2	0.8745	$2,g$								1	14	<25
9124.3	0.8746	$0,g^+$	0	1	0	0	0	14	0	1	14	40
9125.0	0.8547	$2,g$	1	0	1	7	1	1	1	2	8	52
9125.1	0.8710	$1,u$								1	13	<25
9126.5	0.8584	$1,g$	1	1	0	1	1	8	0	2	9	31
9126.8	0.8745	$0,u^-$	0	1	0	11	−1	3	1	1	14	33
9128.3	0.8884	$1,g$								0	19	<25
9128.3	0.8884	$1,u$								0	19	<25
9129.1	0.8650	$1,u$								2	11	<25
9130.0	0.8650	$1,g$								2	11	<25
9130.1	0.8710	$1,g$								1	13	<25
9130.2	0.8463	$1,g$	0	1	2	3	1	2	0	3	5	40
9130.6	0.8747	$2,u$	0	1	0	3	−1	11	3	1	14	29
9130.9	0.8547	$2,u$	1	0	1	6	0	2	2	2	8	27
9133.2	0.8745	$2,g$								1	14	<25
9134.0	0.8747	$0,g^+$	0	1	0	2	2	12	−2	1	14	44
9134.1	0.8710	$1,g$								1	13	<25
9134.1	0.8860	$0,g^-$	0	0	0	10	−8	8	8	0	18	63
9134.3	0.8741	$0,g^-$	0	1	0	12	−2	2	2	1	14	73
9135.1	0.8861	$0,g^+$	0	0	0	8	8	10	−8	0	18	35
		$0,g^+$	0	0	0	10	8	8	−8	0	18	28
9135.3	0.8745	$2,u$								1	14	<25
9135.4	0.8548	$0,g^+$	1	0	1	3	3	5	−3	2	8	62
9135.8	0.8548	$0,g^-$	1	0	1	3	−3	5	3	2	8	71
9136.0	0.8709	$1,u$								1	13	<25

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9136.8	0.8548	2,*g*	1	0	1	3	−3	5	5	2	8	90
9137.4	0.8861	0,u^-								0	18	<25
9137.8	0.8547	0,u^+	1	0	1	6	0	2	0	2	8	31
9138.6	0.8464	1,*u*	0	1	2	2	2	3	−1	3	5	27
		1,*u*	0	1	2	2	0	3	1	3	5	28
		1,*u*	0	1	2	2	−2	3	3	3	5	39
9138.8	0.8860	2,*u*	0	0	0	11	9	7	−7	0	18	54
9139.5	0.8744	2,*g*								1	14	<25
9139.8	0.8421	0,u^+	2	1	0	1	1	3	−1	3	4	97
9142.3	0.8547	2,*u*	1	0	1	6	2	2	0	2	8	26
9142.5	0.8745	2,*g*								1	14	<25
9143.8	0.8464	1,*u*	0	1	2	2	2	3	−1	3	5	40
		1,*u*	0	1	2	2	−2	3	3	3	5	52
9144.3	0.8861	2,*g*								0	18	<25
9145.1	0.8649	1,*u*	0	2	0	6	6	5	−5	2	11	60
9146.2	0.8548	2,*g*	1	0	1	3	3	5	−1	2	8	50
9146.3	0.8440	0,g^+	0	4	0	0	0	4	0	4	4	96
9146.7	0.8748	0,u^+	0	1	0	1	1	13	−1	1	14	50
		0,u^+	0	1	0	3	1	11	−1	1	14	32
9146.8	0.8709	1,*g*								1	13	<25
9146.9	0.8861	2,*u*	0	0	0	9	−7	9	9	0	18	31
9147.3	0.8548	0,g^+	1	0	1	3	1	5	−1	2	8	37
		0,g^+	1	0	1	5	1	3	−1	2	8	27
9147.8	0.8709	1,*u*								1	13	<25
9147.9	0.8421	2,*u*	2	1	0	1	1	3	1	3	4	57
		2,*u*	2	1	0	1	−1	3	3	3	4	41
9148.5	0.8421	0,u^-	2	1	0	1	−1	3	1	3	4	95
9148.8	0.8699	1,*g*								1	13	<25
9149.1	0.8699	1,*u*								1	13	<25
9150.4	0.8585	1,*u*	1	1	0	0	0	9	1	2	9	72
9151.0	0.8833	1,*u*	0	0	0	16	2	1	−1	0	17	35
		1,*u*	0	0	0	16	0	1	1	0	17	63
9151.3	0.8709	1,*u*								1	13	<25
9152.0	0.8710	1,*g*	0	0	1	8	2	5	−1	1	13	27
9152.0	0.8649	1,*g*								2	11	<25
9152.7	0.8742	2,*u*	0	1	0	13	3	1	−1	1	14	52
9152.8	0.8740	0,u^+	0	1	0	13	1	1	−1	1	14	94
9152.9	0.8548	2,*g*	1	0	1	3	−1	5	3	2	8	33
9153.6	0.8464	1,*u*	0	1	2	2	0	3	1	3	5	42
9154.0	0.8440	2,*g*	0	4	0	0	0	4	2	4	4	97
9154.0	0.8746	2,*u*								1	14	<25
9155.2	0.8746	0,g^+	0	1	0	2	0	12	0	1	14	27
9155.3	0.8709	1,*u*	0	0	1	9	1	4	0	1	13	28
9155.3	0.8421	2,*u*	2	1	0	1	1	3	1	3	4	39
		2,*u*	2	1	0	1	−1	3	3	3	4	58
9156.5	0.8709	1,*g*								1	13	<25
9159.0	0.8548	0,g^-	1	0	1	1	−1	7	1	2	8	31
		0,g^-	1	0	1	5	−1	3	1	2	8	39
9160.2	0.8402	1,*u*	0	3	1	3	1	0	0	4	3	98
9161.6	0.8861	0,u^+	0	0	0	9	7	9	−7	0	18	28
9162.0	0.8743	0,u^-								1	14	<25
9162.1	0.8746	2,*g*	0	1	0	2	0	12	2	1	14	25
9163.1	0.8709	1,*g*								1	13	<25
9163.9	0.8649	1,*u*								2	11	<25
9164.3	0.8548	2,*u*	1	0	1	5	1	3	1	2	8	29
9166.8	0.8710	1,*u*								1	13	<25
9167.4	0.8385	1,*u*	2	0	1	3	1	0	0	3	3	97
9167.4	0.8549	0,u^+	1	0	1	2	2	6	−2	2	8	55
		0,u^+	1	0	1	2	0	6	0	2	8	29
9169.0	0.8465	1,*g*	0	1	2	1	1	4	0	3	5	42
		1,*g*	0	1	2	1	−1	4	2	3	5	49
9169.3	0.8743	2,*u*								1	14	<25
9169.6	0.8649	1,*g*	0	2	0	5	−5	6	6	2	11	46
9170.3	0.8861	2,*g*								0	18	<25

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9171.4	0.8549	$0,u^-$	1	0	1	2	−2	6	2	2	8	66
		$0,u^-$	1	0	1	4	−2	4	2	2	8	29
9172.2	0.8861	$0,g^+$	0	0	0	10	8	8	−8	0	18	36
9172.9	0.8549	$2,u$	1	0	1	2	−2	6	4	2	8	62
9175.2	0.8485	$0,g^+$	1	2	0	6	0	0	0	3	6	84
9175.3	0.8302	$0,g^+$	1	1	2	0	0	0	0	4	0	97
9176.1	0.8710	$1,u$								1	13	<25
9176.2	0.8711	$1,g$								1	13	<25
9177.6	0.8485	$2,g$	1	2	0	6	2	0	0	3	6	86
9178.0	0.8742	$0,g^+$	0	1	0	12	0	2	0	1	14	32
9178.5	0.8549	$2,u$	1	0	1	2	2	6	0	2	8	47
9179.1	0.8465	$1,g$	0	1	2	1	1	4	0	3	5	42
		$1,g$	0	1	2	1	−1	4	2	3	5	39
9179.3	0.8861	$2,u$								0	18	<25
9180.0	0.8486	$0,u^+$	1	2	0	5	1	1	−1	3	6	91
9180.5	0.8708	$1,g$	0	0	1	10	0	3	1	1	13	40
9180.8	0.8486	$2,u$	1	2	0	5	3	1	−1	3	6	75
9181.6	0.8699	$1,g$	1	0	0	7	7	6	−6	1	13	55
9182.7	0.8711	$1,g$								1	13	<25
9182.8	0.8548	$0,u^+$	1	0	1	4	0	4	0	2	8	25
9182.9	0.8710	$1,u$								1	13	<25
9183.1	0.8403	$1,g$	0	3	1	2	2	1	−1	4	3	71
		$1,g$	0	3	1	2	0	1	1	4	3	29
9183.9	0.8649	$1,u$								2	11	<25
9184.0	0.8862	$0,g^-$	0	0	0	8	−8	10	8	0	18	26
9184.1	0.8649	$1,g$								2	11	<25
9184.3	0.8742	$2,g$								1	14	<25
9185.7	0.8649	$1,g$								2	11	<25
9185.7	0.8649	$1,u$								2	11	<25
9185.9	0.8862	$0,u^-$	0	0	0	7	−7	11	7	0	18	53
9186.8	0.8422	$0,g^+$	2	1	0	0	0	4	0	3	4	96
9186.9	0.8699	$1,u$								1	13	<25
9187.0	0.8710	$1,u$								1	13	<25
9188.7	0.8548	$2,u$								2	8	<25
9189.1	0.8710	$1,g$								1	13	<25
9190.3	0.8767	$1,u$								1	15	<25
9190.3	0.8767	$1,g$								1	15	<25
9191.8	0.8386	$1,g$	2	0	1	2	2	1	−1	3	3	71
		$1,g$	2	0	1	2	0	1	1	3	3	28
9192.0	0.8711	$1,u$								1	13	<25
9192.6	0.8862	$2,g$	0	0	0	8	8	10	−6	0	18	28
9192.8	0.8649	$1,g$	0	2	0	5	5	6	−4	2	11	28
9193.1	0.8833	$1,g$	0	0	0	17	1	0	0	0	17	98
9193.4	0.8403	$1,g$	0	3	1	2	2	1	−1	4	3	29
		$1,g$	0	3	1	2	0	1	1	4	3	70
9193.8	0.8486	$0,u^-$	1	2	0	5	−1	1	1	3	6	79
9194.4	0.8487	$2,g$	1	2	0	4	4	2	−2	3	6	90
9194.5	0.8422	$2,g$	2	1	0	0	0	4	2	3	4	97
9195.1	0.8707	$1,u$	0	0	1	11	3	2	−2	1	13	28
		$1,u$	0	0	1	11	1	2	0	1	13	30
9195.3	0.8862	$2,u$								0	18	<25
9195.6	0.8740	$0,u^-$	0	1	0	13	−1	1	1	1	14	84
9196.7	0.8649	$1,u$	0	2	0	8	4	3	−3	2	11	34
9197.6	0.8861	$0,g^-$								0	18	<25
9197.6	0.8487	$0,g^+$	1	2	0	4	2	2	−2	3	6	66
9197.8	0.8486	$2,u$	1	2	0	5	1	1	1	3	6	67
9198.1	0.8550	$0,g^+$	1	0	1	1	1	7	−1	2	8	81
9200.1	0.8740	$2,u$	0	1	0	13	1	1	1	1	14	57
9200.6	0.8343	$1,g$	0	5	0	1	1	0	0	5	1	100
9201.1	0.8649	$1,g$	0	2	0	7	−3	4	4	2	11	36
9201.7	0.8465	$1,u$	0	1	2	0	0	5	1	3	5	87
9202.2	0.8386	$1,g$	2	0	1	2	2	1	−1	3	3	28
		$1,g$	2	0	1	2	0	1	1	3	3	69
9203.7	0.8712	$1,g$								1	13	<25

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9203.9	0.8487	$0,g^-$	1	2	0	4	−2	2	2	3	6	91
9204.3	0.8649	$1,u$	0	2	0	8	2	3	−1	2	11	27
9204.6	0.8699	$1,g$	1	0	0	7	7	6	−6	1	13	29
9204.7	0.8550	$2,g$	1	0	1	1	1	7	1	2	8	31
		$2,g$	1	0	1	1	−1	7	3	2	8	51
9204.8	0.8861	$2,u$								0	18	<25
9207.8	0.8861	$0,u^+$	0	0	0	9	7	9	−7	0	18	32
9208.4	0.8549	$0,g^-$	1	0	1	1	−1	7	1	2	8	50
		$0,g^-$	1	0	1	3	−1	5	1	2	8	35
9208.8	0.8648	$1,u$	0	2	0	8	0	3	1	2	11	27
		$1,u$	0	2	0	8	−2	3	3	2	11	29
9209.3	0.8648	$1,g$	0	2	0	7	−1	4	2	2	11	30
9209.5	0.8487	$2,g$	1	2	0	4	2	2	0	3	6	41
		$2,g$	1	2	0	4	0	2	2	3	6	39
9211.8	0.8648	$1,g$	0	2	0	9	3	2	−2	2	11	26
9212.3	0.8699	$1,u$								1	13	<25
9213.1	0.8739	$0,g^+$	0	1	0	14	0	0	0	1	14	96
9213.3	0.8699	$1,u$	1	0	0	6	−6	7	7	1	13	38
9213.8	0.8699	$1,g$								1	13	<25
9214.2	0.8709	$1,g$								1	13	<25
9214.8	0.8649	$1,u$								2	11	<25
9214.9	0.8549	$2,g$	1	0	1	1	1	7	1	2	8	33
9215.0	0.8861	$2,g$								0	18	<25
9215.2	0.8861	$0,u^-$	0	0	0	11	−7	7	7	0	18	34
9215.3	0.8739	$2,g$	0	1	0	14	2	0	0	1	14	95
9215.3	0.8487	$0,g^+$	1	2	0	4	0	2	0	3	6	45
9218.3	0.8710	$1,u$								1	13	<25
9220.0	0.8404	$1,u$	0	3	1	1	1	2	0	4	3	54
		$1,u$	0	3	1	1	−1	2	2	4	3	45
9220.4	0.8487	$2,g$	1	2	0	4	2	2	0	3	6	26
		$2,g$	1	2	0	4	0	2	2	3	6	47
9220.7	0.8427	$0,u^+$	0	0	3	4	0	0	0	3	4	84
9221.5	0.8711	$1,g$	0	0	1	2	0	11	1	1	13	28
9222.3	0.8487	$0,u^+$	1	2	0	3	3	3	−3	3	6	74
9222.5	0.8861	$2,g$								0	18	<25
9223.7	0.8427	$2,u$	0	0	3	4	2	0	0	3	4	88
9224.1	0.8487	$0,u^-$	1	2	0	3	−3	3	3	3	6	95
9225.5	0.8428	$0,g^+$	0	0	3	3	1	1	−1	3	4	92
9226.2	0.8861	$0,g^+$								0	18	<25
9226.5	0.8708	$1,u$								1	13	<25
9227.8	0.8649	$1,g$								2	11	<25
9227.8	0.8550	$0,u^+$	1	0	1	0	0	8	0	2	8	70
9228.0	0.8404	$1,u$	0	3	1	1	1	2	0	4	3	44
		$1,u$	0	3	1	1	−1	2	2	4	3	55
9228.1	0.8428	$2,g$	0	0	3	3	3	1	−1	3	4	81
9229.9	0.8615	$0,u^+$	0	1	1	4	2	6	−2	2	10	25
9229.9	0.8615	$0,g^-$	0	1	1	3	−1	7	1	2	10	33
		$0,g^-$	0	1	1	5	−1	5	1	2	10	28
9230.1	0.8386	$1,u$	2	0	1	1	1	2	0	3	3	54
		$1,u$	2	0	1	1	−1	2	2	3	3	45
9231.0	0.8487	$2,u$	1	2	0	3	3	3	−1	3	6	69
9231.1	0.8649	$1,u$								2	11	<25
9231.8	0.8709	$1,u$								1	13	<25
9232.6	0.8861	$0,u^-$	0	0	0	9	−7	9	7	0	18	47
9232.7	0.8487	$0,u^+$	1	2	0	3	1	3	−1	3	6	62
9232.8	0.8860	$0,u^+$	0	0	0	11	7	7	−7	0	18	65
9234.6	0.8550	$2,u$	1	0	1	0	0	8	2	2	8	71
9235.0	0.8861	$2,u$								0	18	<25
9235.9	0.8649	$1,u$								2	11	<25
9236.5	0.8428	$0,g^-$	0	0	3	3	−1	1	1	3	4	85
9236.7	0.8615	$2,u$								2	10	<25
9236.8	0.8615	$2,g$								2	10	<25
9237.5	0.8650	$1,g$								2	11	<25
9237.7	0.8861	$0,g^-$	0	0	0	8	−6	10	6	0	18	49

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9238.1	0.8386	1,*u*	2	0	1	1	1	2	0	3	3	44
		1,*u*	2	0	1	1	−1	2	2	3	3	55
9238.4	0.8698	1,*u*	1	0	0	8	6	5	−5	1	13	47
9238.8	0.8699	1,*g*	1	0	0	7	−5	6	6	1	13	26
9239.0	0.8705	1,*g*	0	0	1	12	2	1	−1	1	13	58
		1,*g*	0	0	1	12	0	1	1	1	13	33
9239.5	0.8487	2,*u*	1	2	0	3	−1	3	3	3	6	64
9240.3	0.8648	1,*u*								2	11	<25
9240.5	0.8428	2,*g*	0	0	3	3	1	1	1	3	4	71
9241.4	0.8648	1,*g*	0	2	0	9	−1	2	2	2	11	26
9242.2	0.8429	0,u^+	0	0	3	2	2	2	−2	3	4	68
9242.9	0.8487	0,u^-	1	2	0	3	−1	3	1	3	6	60
9243.0	0.8861	2,*u*	0	0	0	9	7	9	−5	0	18	35
9243.1	0.8859	2,*g*	0	0	0	12	8	6	−6	0	18	49
9243.8	0.8861	2,*g*	0	0	0	8	−6	10	8	0	18	34
9246.9	0.8648	1,*g*								2	11	<25
9247.0	0.8429	0,u^-	0	0	3	2	−2	2	2	3	4	99
9247.2	0.8649	1,*u*								2	11	<25
9247.6	0.8699	1,*u*	1	0	0	6	6	7	−5	1	13	28
9248.0	0.8862	0,u^-								0	18	<25
9248.4	0.8487	2,*u*	1	2	0	3	1	3	1	3	6	42
9249.8	0.8699	1,*g*								1	13	<25
9250.0	0.8344	1,*u*	0	5	0	0	0	1	1	5	1	100
9251.4	0.8429	2,*u*	0	0	3	2	2	2	0	3	4	53
		2,*u*	0	0	3	2	0	2	2	3	4	40
9251.5	0.8709	1,*g*								1	13	<25
9253.9	0.8699	1,*u*								1	13	<25
9255.6	0.8861	2,*g*								0	18	<25
9256.1	0.8429	0,u^+	0	0	3	2	2	2	−2	3	4	30
		0,u^+	0	0	3	2	0	2	0	3	4	51
9257.8	0.8615	0,g^+	0	1	1	5	3	5	−3	2	10	31
9258.1	0.8615	0,u^-	0	1	1	4	−4	6	4	2	10	27
		0,u^-	0	1	1	4	−2	6	2	2	10	25
9259.3	0.8649	1,*u*								2	11	<25
9259.3	0.8614	2,*u*	0	1	1	6	6	4	−4	2	10	63
9260.5	0.8488	0,g^+	1	2	0	2	2	4	−2	3	6	64
		0,g^+	1	2	0	2	0	4	0	3	6	30
9260.9	0.8429	2,*u*	0	0	3	2	2	2	0	3	4	35
		2,*u*	0	0	3	2	0	2	2	3	4	52
9261.2	0.8650	1,*u*								2	11	<25
9261.6	0.8861	0,g^+								0	18	<25
9261.9	0.8699	1,*g*								1	13	<25
9262.3	0.8615	2,*g*	0	1	1	5	5	5	−3	2	10	34
9262.4	0.8405	1,*g*	0	3	1	0	0	3	1	4	3	98
9265.2	0.8488	0,g^-	1	2	0	2	−2	4	2	3	6	91
9267.7	0.8707	1,*u*	0	0	1	11	1	2	0	1	13	28
9267.7	0.8650	1,*g*	0	2	0	3	−3	8	4	2	11	35
9268.2	0.8488	2,*g*	1	2	0	2	2	4	0	3	6	27
		2,*g*	1	2	0	2	0	4	2	3	6	28
		2,*g*	1	2	0	2	−2	4	4	3	6	41
9268.7	0.8861	2,*u*	0	0	0	11	7	7	−5	0	18	29
9268.7	0.8429	0,g^+	0	0	3	1	1	3	−1	3	4	92
9270.6	0.8614	2,*u*	0	1	1	6	6	4	−4	2	10	31
9271.9	0.8861	0,g^-	0	0	0	10	−6	8	6	0	18	46
9272.0	0.8488	2,*g*	1	2	0	2	2	4	0	3	6	42
		2,*g*	1	2	0	2	−2	4	4	3	6	50
9272.3	0.8615	0,g^-	0	1	1	5	−5	5	5	2	10	68
9273.9	0.8387	1,*g*	2	0	1	0	0	3	1	3	3	97
9274.6	0.8488	0,g^+	1	2	0	2	0	4	0	3	6	46
9274.7	0.8650	1,*g*								2	11	<25
9275.5	0.8615	0,u^+	0	1	1	4	4	6	−4	2	10	36
		0,u^+	0	1	1	6	4	4	−4	2	10	46
9276.4	0.8430	2,*g*	0	0	3	1	1	3	1	3	4	40
		2,*g*	0	0	3	1	−1	3	3	3	4	55

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9276.9	0.8647	1,g	0	2	0	11	1	0	0	2	11	71
9277.0	0.8698	1,u	1	0	0	8	−4	5	5	1	13	35
9278.1	0.8698	1,g	1	0	0	9	5	4	−4	1	13	28
9278.8	0.8429	0,g^-	0	0	3	1	−1	3	1	3	4	85
9280.0	0.8614	2,g								2	10	<25
9280.7	0.8488	2,g	1	2	0	2	0	4	2	3	6	49
9280.9	0.8615	0,g^+	0	1	1	5	5	5	−5	2	10	75
9281.2	0.8767	1,u								1	15	<25
9281.2	0.8767	1,g								1	15	<25
9282.2	0.8863	0,u^+	0	0	0	5	5	13	−5	0	18	47
9282.3	0.8861	2,u								0	18	<25
9282.7	0.8648	1,u	0	2	0	10	0	1	1	2	11	36
9283.7	0.8706	1,g	0	0	1	12	2	1	−1	1	13	30
		1,g	0	0	1	12	0	1	1	1	13	47
9284.2	0.8863	0,g^+	0	0	0	6	6	12	−6	0	18	48
9284.4	0.8429	2,g	0	0	3	1	1	3	1	3	4	48
		2,g	0	0	3	1	−1	3	3	3	4	43
9286.4	0.8651	1,g								2	11	<25
9287.7	0.8861	0,u^-								0	18	<25
9288.5	0.8698	1,u								1	13	<25
9288.9	0.8698	1,g								1	13	<25
9289.6	0.8614	2,u								2	10	<25
9290.4	0.8614	0,u^-	0	1	1	6	−4	4	4	2	10	42
9290.7	0.8863	2,u								0	18	<25
9291.3	0.8862	2,g								0	18	<25
9291.5	0.8884	1,g								0	19	<25
9291.5	0.8884	1,u								0	19	<25
9292.1	0.8698	1,g	1	0	0	7	5	6	−4	1	13	32
9292.2	0.8614	0,g^-	0	1	1	5	−5	5	5	2	10	29
		0,g^-	0	1	1	5	−3	5	3	2	10	39
9293.5	0.8861	2,g								0	18	<25
9294.4	0.8451	1,u	1	1	1	5	1	0	0	3	5	89
9298.0	0.8705	1,u	0	0	1	13	1	0	0	1	13	93
9298.5	0.8648	1,g								2	11	<25
9298.7	0.8614	2,g								2	10	<25
9298.9	0.8430	0,u^+	0	0	3	0	0	4	0	3	4	88
9299.0	0.8861	0,u^+								0	18	<25
9300.4	0.8698	1,u								1	13	<25
9301.0	0.8489	0,u^+	1	2	0	1	1	5	−1	3	6	93
9301.7	0.8859	0,g^-	0	0	0	12	−6	6	6	0	18	48
9301.8	0.8452	1,g	1	1	1	4	2	1	−1	3	5	64
		1,g	1	1	1	4	0	1	1	3	5	30
9302.6	0.8368	0,g^+	0	2	2	2	0	0	0	4	2	98
9302.8	0.8651	1,u	0	2	0	2	−2	9	3	2	11	35
9303.2	0.8699	1,g								1	13	<25
9303.7	0.8614	0,g^+	0	1	1	7	3	3	−3	2	10	29
		0,g^+	0	1	1	7	1	3	−1	2	10	35
9304.0	0.8614	0,u^+	0	1	1	6	2	4	−2	2	10	40
9304.9	0.8860	2,u	0	0	0	11	−5	7	7	0	18	33
9305.1	0.8368	2,g	0	2	2	2	2	0	0	4	2	99
9305.3	0.8699	1,u								1	13	<25
9305.6	0.8859	0,g^+	0	0	0	12	6	6	−6	0	18	56
9305.9	0.8614	2,g	0	1	1	5	5	5	−3	2	10	36
		2,g	0	1	1	7	5	3	−3	2	10	40
9306.1	0.8430	2,u	0	0	3	0	0	4	2	3	4	91
9307.6	0.8614	2,u	0	1	1	4	−4	6	6	2	10	43
9307.9	0.8861	2,g								0	18	<25
9308.2	0.8615	0,u^+								2	10	<25
9308.3	0.8535	2,g	2	0	0	6	4	2	−2	2	8	76
9308.3	0.8489	2,u	1	2	0	1	1	5	1	3	6	44
		2,u	1	2	0	1	−1	5	3	3	6	50
9308.3	0.8615	0,g^-	0	1	1	7	−1	3	1	2	10	31
9308.4	0.8535	2,u	2	0	0	5	3	3	−1	2	8	25
		2,u	2	0	0	7	3	1	−1	2	8	54

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9308.5	0.8325	1,g	2	2	0	1	1	0	0	4	1	99
9308.7	0.8652	1,u	0	2	0	2	2	9	−1	2	11	36
		1,u	0	2	0	2	0	9	1	2	11	29
9308.7	0.8489	0,u^-	1	2	0	1	−1	5	1	3	6	82
9309.2	0.8535	0,u^+	2	0	0	7	1	1	−1	2	8	68
9310.2	0.8535	0,g^+	2	0	0	6	0	2	0	2	8	47
9310.9	0.8861	0,g^+	0	0	0	8	6	10	−6	0	18	27
9312.0	0.8614	2,u	0	1	1	8	4	2	−2	2	10	34
9312.0	0.8536	0,u^-	2	0	0	5	−1	3	1	2	8	41
		0,u^-	2	0	0	7	−1	1	1	2	8	27
9312.7	0.8536	2,u	2	0	0	5	5	3	−3	2	8	89
9313.4	0.8535	2,g	2	0	0	6	2	2	0	2	8	45
9313.5	0.8698	1,g	1	0	0	9	−3	4	4	1	13	38
9313.8	0.8536	0,g^+	2	0	0	6	2	2	−2	2	8	66
9314.2	0.8697	1,u	1	0	0	10	4	3	−3	1	13	49
9314.4	0.8615	2,g								2	10	<25
9315.3	0.8614	0,u^-	0	1	1	4	−4	6	4	2	10	27
		0,u^-	0	1	1	8	−2	2	2	2	10	30
9315.4	0.8489	2,u	1	2	0	1	1	5	1	3	6	43
		2,u	1	2	0	1	−1	5	3	3	6	41
9315.5	0.8452	1,g	1	1	1	4	2	1	−1	3	5	28
		1,g	1	1	1	4	0	1	1	3	5	58
9316.1	0.8614	0,u^+	0	1	1	4	4	6	−4	2	10	31
9316.3	0.8860	2,u								0	18	<25
9316.6	0.8614	0,g^+	0	1	1	3	3	7	−3	2	10	27
		0,g^+	0	1	1	7	3	3	−3	2	10	34
9316.8	0.8698	1,g								1	13	<25
9317.2	0.8614	2,u								2	10	<25
9317.3	0.8650	1,u	0	2	0	0	0	11	1	2	11	26
9317.3	0.8536	0,g^-	2	0	0	4	−2	4	2	2	8	27
		0,g^-	2	0	0	6	−2	2	2	2	8	64
9317.8	0.8698	1,u								1	13	<25
9318.5	0.8536	2,u	2	0	0	5	1	3	1	2	8	32
		2,u	2	0	0	7	1	1	1	2	8	39
9320.0	0.8860	0,u^-	0	0	0	11	−5	7	5	0	18	50
9320.7	0.8452	1,u	1	1	1	3	3	2	−2	3	5	74
9320.8	0.8861	0,u^+	0	0	0	7	5	11	−5	0	18	39
9321.8	0.8861	2,u								0	18	<25
9321.8	0.8614	0,g^-	0	1	1	7	−3	3	3	2	10	49
9322.2	0.8614	2,g								2	10	<25
9322.4	0.8698	1,u								1	13	<25
9324.9	0.8614	2,g	0	1	1	7	−1	3	3	2	10	27
9325.3	0.8536	0,u^+	2	0	0	5	3	3	−3	2	8	76
9325.4	0.8615	2,u	0	1	1	4	−4	6	6	2	10	33
		2,u	0	1	1	6	−2	4	4	2	10	27
9326.3	0.8862	2,g								0	18	<25
9326.3	0.8536	0,u^-	2	0	0	5	−3	3	3	2	8	78
9326.3	0.8615	0,u^-	0	1	1	4	−4	6	4	2	10	31
9327.1	0.8614	2,u	0	1	1	8	0	2	2	2	10	32
9327.2	0.8698	1,g	1	0	0	9	−1	4	2	1	13	31
9327.2	0.8614	0,g^+	0	1	1	5	1	5	−1	2	10	32
9327.4	0.8536	2,g	2	0	0	6	0	2	2	2	8	58
9327.5	0.8860	2,g	0	0	0	12	6	6	−4	0	18	37
9329.0	0.8452	1,u	1	1	1	3	−1	2	2	3	5	55
9329.0	0.8369	0,u^+	0	2	2	1	1	1	−1	4	2	99
9330.2	0.8614	0,u^+								2	10	<25
9330.7	0.8861	0,u^+	0	0	0	9	5	9	−5	0	18	45
9330.9	0.8860	0,g^-	0	0	0	12	−6	6	6	0	18	32
9332.2	0.8861	0,g^+								0	18	<25
9332.4	0.8697	1,u								1	13	<25
9333.0	0.8535	0,g^+	2	0	0	8	0	0	0	2	8	72
9333.1	0.8652	1,g	0	2	0	1	1	10	0	2	11	31
		1,g	0	2	0	1	−1	10	2	2	11	41
9333.4	0.8698	1,g	1	0	0	7	−1	6	2	1	13	26

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9335.1	0.8698	1,g								1	13	<25
9335.3	0.8614	2,g	0	1	1	7	−1	3	3	2	10	25
9335.4	0.8766	1,u								1	15	<25
9335.6	0.8535	2,g	2	0	0	8	2	0	0	2	8	69
9336.2	0.8369	0,u^-	0	2	2	1	−1	1	1	4	2	99
9336.3	0.8767	1,g								1	15	<25
9338.4	0.8536	2,u	2	0	0	5	3	3	−1	2	8	33
9338.6	0.8536	0,u^+	2	0	0	5	1	3	−1	2	8	45
		0,u^+	2	0	0	7	1	1	−1	2	8	30
9339.0	0.8860	2,u								0	18	<25
9339.1	0.8537	0,g^+	2	0	0	4	4	4	−4	2	8	94
9339.2	0.8537	0,g^-	2	0	0	4	−4	4	4	2	8	93
9339.3	0.8369	2,u	0	2	2	1	1	1	1	4	2	99
9339.3	0.8733	0,u^+								1	14	<25
9339.3	0.8733	0,g^-	0	0	1	5	−1	9	1	1	14	28
9339.5	0.8452	1,u	1	1	1	3	1	2	0	3	5	45
		1,u	1	1	1	3	−1	2	2	3	5	31
9339.9	0.8651	1,g								2	11	<25
9340.3	0.8861	2,g								0	18	<25
9341.0	0.8614	2,u	0	1	1	4	4	6	−2	2	10	31
9341.5	0.8698	1,u	1	0	0	10	−2	3	3	1	13	28
9341.9	0.8490	0,g^+	1	2	0	0	0	6	0	3	6	90
9343.0	0.8536	2,u	2	0	0	5	−1	3	3	2	8	63
9344.0	0.8860	2,u								0	18	<25
9344.6	0.8699	1,u								1	13	<25
9344.6	0.8613	0,g^+	0	1	1	9	1	1	−1	2	10	72
9346.4	0.8613	2,g	0	1	1	9	3	1	−1	2	10	52
9347.3	0.8733	2,u								1	14	<25
9347.3	0.8733	2,g								1	14	<25
9348.0	0.8615	0,u^+								2	10	<25
9349.1	0.8696	1,g	1	0	0	11	3	2	−2	1	13	46
		1,g	1	0	0	11	1	2	0	1	13	28
9349.3	0.8490	2,g	1	2	0	0	0	6	2	3	6	91
9350.1	0.8536	0,u^-	2	0	0	7	−1	1	1	2	8	62
9351.4	0.8537	2,g	2	0	0	4	4	4	−2	2	8	73
9352.1	0.8615	2,u								2	10	<25
9352.3	0.8862	0,u^-								0	18	<25
9353.3	0.8699	1,u	1	0	0	6	0	7	1	1	13	26
9353.4	0.8453	1,g	1	1	1	2	2	3	−1	3	5	33
		1,g	1	1	1	2	0	3	1	3	5	31
		1,g	1	1	1	2	−2	3	3	3	5	31
9353.7	0.8766	1,u								1	15	<25
9353.8	0.8861	0,g^+								0	18	<25
9354.4	0.8614	0,u^-	0	1	1	2	−2	8	2	2	10	27
		0,u^-	0	1	1	8	−2	2	2	2	10	49
9354.7	0.8536	2,u	2	0	0	7	1	1	1	2	8	46
9355.2	0.8553	2,g	0	3	0	6	4	2	−2	3	8	75
9355.4	0.8652	1,u	0	2	0	0	0	11	1	2	11	52
9355.6	0.8767	1,g								1	15	<25
9355.8	0.8553	2,u	0	3	0	5	3	3	−1	3	8	25
		2,u	0	3	0	7	3	1	−1	3	8	45
9356.8	0.8553	0,g^+	0	3	0	6	0	2	0	3	8	40
9357.0	0.8884	1,g								0	19	<25
9357.0	0.8884	1,u								0	19	<25
9357.0	0.8553	0,u^+	0	3	0	5	1	3	−1	3	8	27
		0,u^+	0	3	0	7	1	1	−1	3	8	63
9357.5	0.8537	0,g^+	2	0	0	4	2	4	−2	2	8	45
		0,g^+	2	0	0	4	0	4	0	2	8	30
9357.6	0.8615	0,g^-	0	1	1	3	−3	7	3	2	10	42
		0,g^-	0	1	1	5	−3	5	3	2	10	32
9357.7	0.8554	0,u^-	0	3	0	5	−1	3	1	3	8	41
9358.5	0.8453	1,g	1	1	1	2	2	3	−1	3	5	40
		1,g	1	1	1	2	−2	3	3	3	5	56
9358.7	0.8859	0,u^+	0	0	0	11	5	7	−5	0	18	32

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,u^+$	0	0	0	11	3	7	−3	0	18	25
9358.8	0.8554	$2,u$	0	3	0	5	5	3	−3	3	8	80
9359.3	0.8614	$2,u$								2	10	<25
9359.4	0.8326	$1,u$	2	2	0	0	0	1	1	4	1	98
9359.4	0.8614	$0,u^+$								2	10	<25
9360.0	0.8699	$1,g$	1	0	0	5	−3	8	4	1	13	25
9360.2	0.8615	$2,g$	0	1	1	3	−3	7	5	2	10	46
9360.3	0.8553	$2,g$	0	3	0	6	2	2	0	3	8	47
9360.4	0.8614	$0,g^-$	0	1	1	9	−1	1	1	2	10	39
9360.4	0.8553	$0,g^+$	0	3	0	6	2	2	−2	3	8	61
9361.0	0.8537	$0,g^-$	2	0	0	4	−2	4	2	2	8	47
		$0,g^-$	2	0	0	6	−2	2	2	2	8	32
9361.3	0.8862	$2,u$								0	18	<25
9361.6	0.8580	$1,u$								2	9	<25
9361.6	0.8580	$1,g$								2	9	<25
9361.9	0.8615	$0,g^+$	0	1	1	3	3	7	−3	2	10	34
		$0,g^+$	0	1	1	3	1	7	−1	2	10	36
9362.3	0.8537	$2,g$	2	0	0	4	−2	4	4	2	8	77
9363.5	0.8554	$0,g^-$	0	3	0	4	−2	4	2	3	8	30
		$0,g^-$	0	3	0	6	−2	2	2	3	8	61
9364.3	0.8861	$2,g$								0	18	<25
9364.9	0.8553	$2,u$	0	3	0	5	1	3	1	3	8	34
		$2,u$	0	3	0	7	1	1	1	3	8	36
9365.0	0.8614	$2,g$	0	1	1	9	1	1	1	2	10	40
9365.2	0.8613	$2,u$	0	1	1	8	0	2	2	2	10	31
		$2,u$	0	1	1	10	2	0	0	2	10	25
9366.7	0.8698	$1,u$	1	0	0	10	2	3	−1	1	13	28
9367.8	0.8861	$0,g^+$								0	18	<25
9367.9	0.8453	$1,g$	1	1	1	2	0	3	1	3	5	51
9368.2	0.8860	$2,g$								0	18	<25
9368.2	0.8537	$2,g$	2	0	0	4	2	4	0	2	8	29
9368.2	0.8698	$1,g$								1	13	<25
9368.2	0.8370	$0,g^+$	0	2	2	0	0	2	0	4	2	98
9370.8	0.8698	$1,u$	1	0	0	10	0	3	1	1	13	28
9370.8	0.8699	$1,g$								1	13	<25
9370.9	0.8554	$0,u^+$	0	3	0	5	3	3	−3	3	8	75
9371.4	0.8860	$2,u$	0	0	0	11	5	7	−3	0	18	25
9371.7	0.8615	$2,g$	0	1	1	3	3	7	−1	2	10	33
9371.9	0.8554	$0,u^-$	0	3	0	5	−3	3	3	3	8	76
9372.3	0.8536	$0,g^+$	2	0	0	6	0	2	0	2	8	35
9372.7	0.8860	$0,g^-$	0	0	0	10	−4	8	4	0	18	26
		$0,g^-$	0	0	0	12	−4	6	4	0	18	42
9372.8	0.8766	$1,u$	0	1	0	8	8	7	−7	1	15	43
9373.5	0.8700	$1,g$								1	13	<25
9373.6	0.8615	$0,g^+$								2	10	<25
9373.7	0.8554	$2,g$	0	3	0	6	0	2	2	3	8	55
9376.1	0.8370	$2,g$	0	2	2	0	0	2	2	4	2	99
9377.6	0.8536	$2,g$	2	0	0	6	0	2	2	2	8	26
9377.7	0.8309	$0,u^+$	0	4	1	0	0	0	0	5	0	100
9378.7	0.8860	$2,u$								0	18	<25
9378.9	0.8766	$1,g$	0	1	0	7	−7	8	8	1	15	43
9379.4	0.8615	$2,g$								2	10	<25
9379.7	0.8860	$0,u^+$								0	18	<25
9380.3	0.8860	$2,g$	0	0	0	12	−4	6	6	0	18	34
9380.3	0.8537	$0,u^+$	2	0	0	3	3	5	−3	2	8	74
9380.3	0.8537	$0,u^-$	2	0	0	3	−3	5	3	2	8	79
9381.4	0.8612	$0,u^+$	0	1	1	10	0	0	0	2	10	70
9381.7	0.8580	$1,g$	0	0	2	5	5	4	−4	2	9	31
9381.8	0.8552	$0,g^+$	0	3	0	8	0	0	0	3	8	77
9382.1	0.8580	$1,u$	0	0	2	4	4	5	−3	2	9	27
9383.4	0.8538	$2,u$	2	0	0	3	−3	5	5	2	8	93
9383.5	0.8700	$1,u$	1	0	0	4	0	9	1	1	13	33
9383.6	0.8554	$0,g^+$	0	3	0	4	4	4	−4	3	8	93
9383.7	0.8554	$0,g^-$	0	3	0	4	−4	4	4	3	8	93

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9384.3	0.8860	$0,u^-$	0	0	0	13	−5	5	5	0	18	41
9384.4	0.8552	$2,g$	0	3	0	8	2	0	0	3	8	75
9384.6	0.8612	$2,u$	0	1	1	10	2	0	0	2	10	65
9384.7	0.8391	$1,g$	1	3	0	3	1	0	0	4	3	98
9384.8	0.8553	$2,u$	0	3	0	5	3	3	−1	3	8	28
9384.8	0.8553	$0,u^+$	0	3	0	5	1	3	−1	3	8	40
		$0,u^+$	0	3	0	7	1	1	−1	3	8	35
9387.1	0.8864	$0,g^-$	0	0	0	2	−2	16	2	0	18	38
		$0,g^-$	0	0	0	4	−4	14	4	0	18	35
9387.2	0.8695	$1,u$	1	0	0	12	2	1	−1	1	13	51
		$1,u$	1	0	0	12	0	1	1	1	13	29
9388.0	0.8697	$1,g$								1	13	<25
9388.3	0.8554	$2,u$	0	3	0	5	−1	3	3	3	8	58
9388.8	0.8860	$2,g$								0	18	<25
9388.8	0.8859	$0,g^+$	0	0	0	12	4	6	−4	0	18	36
9389.0	0.8617	$0,u^+$	0	1	1	2	2	8	−2	2	10	44
		$0,u^+$	0	1	1	2	0	8	0	2	10	28
9390.0	0.8580	$1,g$	0	0	2	5	5	4	−4	2	9	60
9390.1	0.8537	$2,u$	2	0	0	3	3	5	−1	2	8	66
9390.2	0.8454	$1,u$	1	1	1	1	1	4	0	3	5	46
		$1,u$	1	1	1	1	−1	4	2	3	5	48
9390.9	0.8863	$0,u^-$	0	0	0	3	−3	15	3	0	18	39
9391.2	0.8537	$0,u^+$	2	0	0	3	1	5	−1	2	8	59
9392.0	0.8616	$0,u^-$	0	1	1	2	−2	8	2	2	10	39
		$0,u^-$	0	1	1	4	−2	6	2	2	10	36
9392.6	0.8614	$0,g^-$	0	1	1	9	−1	1	1	2	10	42
9393.2	0.8616	$2,u$	0	1	1	2	−2	8	4	2	10	44
9394.1	0.8580	$1,u$								2	9	<25
9395.9	0.8863	$2,u$								0	18	<25
9396.4	0.8554	$2,g$	0	3	0	4	4	4	−2	3	8	70
9396.7	0.8553	$0,u^-$	0	3	0	7	−1	1	1	3	8	65
9397.4	0.8863	$2,g$								0	18	<25
9397.4	0.8614	$2,g$	0	1	1	9	1	1	1	2	10	27
9397.6	0.8537	$2,u$	2	0	0	3	−1	5	3	2	8	47
9399.0	0.8454	$1,u$	1	1	1	1	1	4	0	3	5	43
		$1,u$	1	1	1	1	−1	4	2	3	5	44
9399.4	0.8537	$0,u^-$	2	0	0	1	−1	7	1	2	8	27
		$0,u^-$	2	0	0	5	−1	3	1	2	8	42
9399.8	0.8861	$2,u$								0	18	<25
9399.8	0.8579	$1,g$								2	9	<25
9400.3	0.8616	$2,u$	0	1	1	2	2	8	0	2	10	36
9401.1	0.8862	$0,g^-$	0	0	0	4	−2	14	2	0	18	28
9401.3	0.8553	$2,u$	0	3	0	7	1	1	1	3	8	49
9401.7	0.8860	$2,g$								0	18	<25
9401.8	0.8861	$0,u^-$	0	0	0	9	−3	9	3	0	18	33
9401.9	0.8701	$1,g$								1	13	<25
9402.1	0.8554	$0,g^+$	0	3	0	4	2	4	−2	3	8	43
		$0,g^+$	0	3	0	4	0	4	0	3	8	30
9404.2	0.8580	$1,u$	0	0	2	4	−4	5	5	2	9	35
9404.2	0.8858	$0,u^+$	0	0	0	13	5	5	−5	0	18	34
9404.8	0.8700	$1,u$								1	13	<25
9405.2	0.8537	$2,u$	2	0	0	5	1	3	1	2	8	29
9405.7	0.8862	$0,u^-$	0	0	0	5	−3	13	3	0	18	35
		$0,u^-$	0	0	0	7	−3	11	3	0	18	27
9405.9	0.8554	$0,g^-$	0	3	0	4	−2	4	2	3	8	42
		$0,g^-$	0	3	0	6	−2	2	2	3	8	36
9406.3	0.8766	$1,u$								1	15	<25
9406.5	0.8555	$2,g$	0	3	0	4	−2	4	4	3	8	77
9408.1	0.8615	$0,u^+$	0	1	1	0	0	10	0	2	10	31
9410.7	0.8766	$1,g$								1	15	<25
9410.9	0.8861	$2,u$								0	18	<25
9410.9	0.8860	$0,g^+$								0	18	<25
9412.3	0.8580	$1,g$	0	0	2	5	−1	4	2	2	9	26
		$1,g$	0	0	2	5	−3	4	4	2	9	30

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9412.3	0.8861	$0,g^-$	0	0	0	6	−2	12	2	0	18	30
9412.4	0.8698	$1,u$								1	13	<25
9412.9	0.8697	$1,g$	1	0	0	11	1	2	0	1	13	26
9413.0	0.8554	$2,g$	0	3	0	4	2	4	0	3	8	26
9413.7	0.8615	$2,u$	0	1	1	0	0	10	2	2	10	32
9413.8	0.8859	$0,u^+$								0	18	<25
9413.9	0.8617	$0,g^+$	0	1	1	1	1	9	−1	2	10	66
9414.0	0.8416	$0,g^+$	1	0	2	4	0	0	0	3	4	92
9414.2	0.8862	$2,u$								0	18	<25
9414.3	0.8392	$1,u$	1	3	0	2	2	1	−1	4	3	71
		$1,u$	1	3	0	2	0	1	1	4	3	28
9415.2	0.8580	$1,u$	0	0	2	4	−4	5	5	2	9	49
9416.6	0.8416	$2,g$	1	0	2	4	2	0	0	3	4	94
9417.2	0.8863	$2,g$								0	18	<25
9417.7	0.8554	$0,g^+$	0	3	0	6	0	2	0	3	8	35
9418.1	0.8861	$0,u^-$								0	18	<25
9418.3	0.8860	$2,g$								0	18	<25
9418.4	0.8702	$1,u$	1	0	0	2	2	11	−1	1	13	30
9418.6	0.8732	$0,g^+$	0	0	1	5	3	9	−3	1	14	26
9418.7	0.8732	$0,u^-$								1	14	<25
9419.5	0.8538	$0,g^+$	2	0	0	2	2	6	−2	2	8	63
		$0,g^+$	2	0	0	2	0	6	0	2	8	26
9420.2	0.8617	$2,g$	0	1	1	1	1	9	1	2	10	29
		$2,g$	0	1	1	1	−1	9	3	2	10	38
9420.8	0.8766	$1,g$								1	15	<25
9420.8	0.8883	$1,u$								0	19	<25
9420.8	0.8883	$1,g$								0	19	<25
9420.9	0.8538	$0,g^-$	2	0	0	2	−2	6	2	2	8	77
9422.5	0.8766	$1,u$								1	15	<25
9422.7	0.8861	$0,g^-$								0	18	<25
9422.8	0.8554	$2,g$	0	3	0	6	0	2	2	3	8	26
9422.9	0.8861	$2,u$								0	18	<25
9423.6	0.8555	$0,u^+$	0	3	0	3	3	5	−3	3	8	72
9423.6	0.8555	$0,u^-$	0	3	0	3	−3	5	3	3	8	78
9424.9	0.8392	$1,u$	1	3	0	2	2	1	−1	4	3	28
		$1,u$	1	3	0	2	0	1	1	4	3	70
9425.0	0.8417	$0,u^+$	1	0	2	3	1	1	−1	3	4	95
9425.1	0.8538	$2,g$	2	0	0	2	−2	6	4	2	8	76
9425.4	0.8579	$1,u$	0	0	2	4	4	5	−3	2	9	42
		$1,u$	0	0	2	6	4	3	−3	2	9	44
9426.3	0.8555	$2,u$	0	3	0	3	−3	5	5	3	8	93
9426.4	0.8732	$2,u$								1	14	<25
9426.5	0.8732	$2,g$								1	14	<25
9426.5	0.8862	$2,g$								0	18	<25
9426.6	0.8579	$1,g$	0	0	2	3	3	6	−2	2	9	26
		$1,g$	0	0	2	7	3	2	−2	2	9	54
9426.9	0.8417	$2,u$	1	0	2	3	3	1	−1	3	4	82
9428.4	0.8580	$1,u$								2	9	<25
9428.6	0.8580	$1,g$	0	0	2	7	1	2	0	2	9	39
9428.6	0.8538	$2,g$	2	0	0	2	2	6	0	2	8	63
9428.8	0.8864	$0,g^+$	0	0	0	0	0	18	0	0	18	45
9428.9	0.8615	$0,g^-$	0	1	1	3	−1	7	1	2	10	30
		$0,g^-$	0	1	1	5	−1	5	1	2	10	25
9429.1	0.8455	$1,g$	1	1	1	0	0	5	1	3	5	91
9429.9	0.8538	$0,g^+$	2	0	0	2	0	6	0	2	8	29
		$0,g^+$	2	0	0	4	0	4	0	2	8	25
9431.9	0.8579	$1,u$								2	9	<25
9432.1	0.8862	$0,u^-$								0	18	<25
9433.6	0.8555	$2,u$	0	3	0	3	3	5	−1	3	8	63
9433.7	0.8579	$1,g$	0	0	2	7	−1	2	2	2	9	45
9434.4	0.8860	$2,u$								0	18	<25
9434.6	0.8697	$1,u$	1	0	0	12	0	1	1	1	13	31
9434.6	0.8555	$0,u^+$	0	3	0	3	1	5	−1	3	8	55
9434.9	0.8765	$1,g$	0	1	0	9	7	6	−6	1	15	52

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9435.3	0.8701	1,g	1	0	0	1	−1	12	2	1	13	34
9435.3	0.8604	0,u^-	1	1	0	3	−1	7	1	2	10	26
		0,u^-	1	1	0	5	−1	5	1	2	10	31
9435.3	0.8604	0,g^+								2	10	<25
9435.4	0.8616	2,g								2	10	<25
9436.2	0.8538	2,g	2	0	0	2	0	6	2	2	8	31
9436.7	0.8696	1,g	1	0	0	13	1	0	0	1	13	62
9436.7	0.8417	0,u^-	1	0	2	3	−1	1	1	3	4	91
9437.2	0.8862	2,u								0	18	<25
9437.9	0.8860	2,g								0	18	<25
9437.9	0.8861	2,g								0	18	<25
9438.0	0.8861	0,g^-								0	18	<25
9438.6	0.8617	0,u^+	0	1	1	0	0	10	0	2	10	42
9440.0	0.8580	1,u	0	0	2	6	−2	3	3	2	9	36
9440.4	0.8417	2,u	1	0	2	3	1	1	1	3	4	76
9440.7	0.8860	0,u^-								0	18	<25
9440.8	0.8555	2,u	0	3	0	3	−1	5	3	3	8	45
9440.9	0.8604	2,g								2	10	<25
9441.0	0.8604	2,u								2	10	<25
9441.6	0.8766	1,u	0	1	0	8	−6	7	7	1	15	28
9442.6	0.8334	1,u	0	1	3	1	1	0	0	4	1	98
9443.5	0.8555	0,u^-	0	3	0	1	−1	7	1	3	8	28
		0,u^-	0	3	0	5	−1	3	1	3	8	42
9444.1	0.8291	0,u^+	2	1	1	0	0	0	0	4	0	98
9444.7	0.8697	1,g								1	13	<25
9445.3	0.8617	2,u	0	1	1	0	0	10	2	2	10	42
9447.5	0.8418	0,g^+	1	0	2	2	2	2	−2	3	4	65
		0,g^+	1	0	2	2	0	2	0	3	4	31
9448.1	0.8580	1,g	0	0	2	3	−3	6	4	2	9	47
9448.5	0.8374	1,g	3	0	0	3	1	0	0	3	3	98
9449.0	0.8860	2,g								0	18	<25
9449.2	0.8555	2,u	0	3	0	5	1	3	1	3	8	29
9451.6	0.8701	1,u	1	0	0	0	0	13	1	1	13	29
9451.8	0.8859	0,g^-								0	18	<25
9451.9	0.8859	2,u	0	0	0	13	−3	5	5	0	18	36
9452.2	0.8860	0,u^+	0	0	0	9	1	9	−1	0	18	29
9452.7	0.8859	0,g^+								0	18	<25
9452.7	0.8418	0,g^-	1	0	2	2	−2	2	2	3	4	99
9453.2	0.8578	1,u	0	0	2	8	2	1	−1	2	9	34
9453.9	0.8861	0,g^+								0	18	<25
9454.7	0.8603	2,g	1	1	0	6	6	4	−4	2	10	77
9454.9	0.8580	1,g	0	0	2	3	3	6	−2	2	9	33
9456.5	0.8539	0,u^+	2	0	0	1	1	7	−1	2	8	87
9456.7	0.8418	2,g	1	0	2	2	2	2	0	3	4	63
		2,g	1	0	2	2	0	2	2	3	4	33
9458.0	0.8393	1,g	1	3	0	1	1	2	0	4	3	55
		1,g	1	3	0	1	−1	2	2	4	3	44
9458.4	0.8604	0,u^+	1	1	0	5	3	5	−3	2	10	31
9458.7	0.8604	0,g^-	1	1	0	6	−4	4	4	2	10	27
9459.5	0.8766	1,g								1	15	<25
9459.9	0.8603	2,u	1	1	0	5	5	5	−3	2	10	28
		2,u	1	1	0	7	5	3	−3	2	10	38
9460.2	0.8861	2,g								0	18	<25
9461.2	0.8556	0,g^+	0	3	0	2	2	6	−2	3	8	61
		0,g^+	0	3	0	2	0	6	0	3	8	27
9461.9	0.8538	0,u^-	2	0	0	1	−1	7	1	2	8	64
		0,u^-	2	0	0	3	−1	5	1	2	8	28
9461.9	0.8418	0,g^+	1	0	2	2	2	2	−2	3	4	33
		0,g^+	1	0	2	2	0	2	0	3	4	56
9462.8	0.8766	1,u	0	1	0	8	−6	7	7	1	15	28
9463.0	0.8860	2,g								0	18	<25
9463.1	0.8556	0,g^-	0	3	0	2	−2	6	2	3	8	75
9463.3	0.8539	2,u	2	0	0	1	1	7	1	2	8	31
		2,u	2	0	0	1	−1	7	3	2	8	57

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9464.6	0.8859	2,*u*	0	0	0	13	−3	5	5	0	18	27
9466.0	0.8393	1,*g*	1	3	0	1	1	2	0	4	3	43
		1,*g*	1	3	0	1	−1	2	2	4	3	56
9466.5	0.8579	1,*g*								2	9	<25
9466.6	0.8732	0,g^-	0	0	1	7	−7	7	7	1	14	28
9466.8	0.8556	2,*g*	0	3	0	2	−2	6	4	3	8	73
9466.9	0.8418	2,*g*	1	0	2	2	2	2	0	3	4	31
		2,*g*	1	0	2	2	0	2	2	3	4	62
9466.9	0.8864	0,u^+	0	0	0	1	1	17	−1	0	18	56
9468.5	0.8603	2,*g*	1	1	0	6	4	4	−2	2	10	31
9468.7	0.8538	2,*u*	2	0	0	1	1	7	1	2	8	44
9468.9	0.8732	0,u^+	0	0	1	6	6	8	−6	1	14	30
9469.2	0.8578	1,*g*	0	0	2	9	1	0	0	2	9	43
9469.4	0.8860	2,*u*								0	18	<25
9470.0	0.8883	1,*u*								0	19	<25
9470.4	0.8883	1,*g*								0	19	<25
9470.4	0.8860	0,u^+	0	0	0	13	3	5	−3	0	18	29
9470.7	0.8556	2,*g*	0	3	0	2	2	6	0	3	8	59
9470.7	0.8579	1,*u*	0	0	2	8	0	1	1	2	9	36
9471.1	0.8603	0,u^-	1	1	0	5	−5	5	5	2	10	59
9471.8	0.8859	2,*g*								0	18	<25
9472.5	0.8555	0,g^+	0	3	0	4	0	4	0	3	8	26
9473.0	0.8731	2,*u*	0	0	1	8	8	6	−6	1	14	30
9473.1	0.8603	0,g^+	1	1	0	6	4	4	−4	2	10	53
9475.4	0.8581	1,*u*	0	0	2	2	−2	7	3	2	9	31
9475.7	0.8766	1,*u*								1	15	<25
9475.9	0.8334	1,*g*	0	1	3	0	0	1	1	4	1	98
9476.0	0.8865	2,*u*	0	0	0	1	1	17	1	0	18	37
		2,*u*	0	0	0	1	−1	17	3	0	18	29
9476.1	0.8603	2,*u*								2	10	<25
9476.2	0.8767	1,*g*								1	15	<25
9476.3	0.8732	2,*g*								1	14	<25
9478.0	0.8767	1,*u*								1	15	<25
9478.2	0.8858	0,u^-	0	0	0	13	−3	5	3	0	18	42
9478.8	0.8555	2,*g*	0	3	0	2	0	6	2	3	8	27
9478.9	0.8766	1,*g*								1	15	<25
9479.6	0.8375	1,*u*	3	0	0	2	2	1	−1	3	3	71
		1,*u*	3	0	0	2	0	1	1	3	3	28
9480.1	0.8603	0,u^+	1	1	0	5	5	5	−5	2	10	66
9480.7	0.8419	0,u^+	1	0	2	1	1	3	−1	3	4	95
9481.6	0.8858	0,g^+	0	0	0	14	4	4	−4	0	18	62
9482.7	0.8518	1,*g*	0	2	1	6	2	1	−1	3	7	52
9484.5	0.8518	1,*u*	0	2	1	5	1	2	0	3	7	49
9484.5	0.8603	2,*g*								2	10	<25
9484.6	0.8580	1,*u*								2	9	<25
9485.8	0.8732	0,g^-	0	0	1	7	−1	7	1	1	14	26
9486.7	0.8603	0,g^-	1	1	0	6	−4	4	4	2	10	46
		0,g^-	1	1	0	6	−2	4	2	2	10	32
9487.3	0.8732	0,u^+								1	14	<25
9487.8	0.8578	1,*g*	0	0	2	9	1	0	0	2	9	42
9488.5	0.8519	1,*u*	0	2	1	5	3	2	−2	3	7	59
9488.6	0.8419	2,*u*	1	0	2	1	1	3	1	3	4	49
		2,*u*	1	0	2	1	−1	3	3	3	4	48
9488.9	0.8859	2,*u*								0	18	<25
9489.3	0.8603	0,u^-	1	1	0	5	−5	5	5	2	10	38
		0,u^-	1	1	0	5	−3	5	3	2	10	25
		0,u^-	1	1	0	7	−3	3	3	2	10	26
9490.0	0.8419	0,u^-	1	0	2	1	−1	3	1	3	4	91
9490.2	0.8375	1,*u*	3	0	0	2	2	1	−1	3	3	28
		1,*u*	3	0	0	2	0	1	1	3	3	70
9490.4	0.8857	0,g^-	0	0	0	14	−4	4	4	0	18	59
9490.6	0.8864	0,g^+	0	0	0	2	0	16	0	0	18	26
9490.7	0.8519	1,*g*	0	2	1	4	0	3	1	3	7	31
		1,*g*	0	2	1	6	0	1	1	3	7	35

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9490.8	0.8732	2,u								1	14	<25
9491.5	0.8540	0,g^+	2	0	0	0	0	8	0	2	8	81
9493.3	0.8861	0,u^+	0	0	0	5	1	13	−1	0	18	29
9493.4	0.8603	2,u								2	10	<25
9493.6	0.8602	0,u^+	1	1	0	7	3	3	−3	2	10	32
		0,u^+	1	1	0	7	1	3	−1	2	10	41
9493.9	0.8602	0,g^+	1	1	0	8	2	2	−2	2	10	29
9494.0	0.8731	0,g^+	0	0	1	7	7	7	−7	1	14	78
9494.1	0.8732	2,g								1	14	<25
9494.9	0.8863	2,g								0	18	<25
9494.9	0.8858	0,u^-	0	0	0	13	−1	5	1	0	18	57
9495.8	0.8764	1,u	0	1	0	10	6	5	−5	1	15	63
9496.3	0.8419	2,u	1	0	2	1	1	3	1	3	4	44
		2,u	1	0	2	1	−1	3	3	3	4	51
9496.3	0.8519	1,g	0	2	1	4	4	3	−3	3	7	95
9496.6	0.8519	1,u	0	2	1	5	−1	2	2	3	7	66
9496.8	0.8557	0,u^+	0	3	0	1	1	7	−1	3	8	86
9497.4	0.8765	1,g	0	1	0	9	−5	6	6	1	15	34
9498.5	0.8540	2,g	2	0	0	0	0	8	2	2	8	82
9499.4	0.8603	2,u	1	1	0	5	5	5	−3	2	10	40
9500.0	0.8580	1,u	0	0	2	0	0	9	1	2	9	36
9500.1	0.8582	1,g	0	0	2	1	1	8	0	2	9	28
		1,g	0	0	2	1	−1	8	2	2	9	33
9501.2	0.8603	2,g	1	1	0	8	4	2	−2	2	10	46
9501.2	0.8860	2,u	0	0	0	13	−1	5	3	0	18	31
9501.5	0.8862	0,g^+								0	18	<25
9501.7	0.8731	2,u	0	0	1	8	8	6	−6	1	14	28
9503.1	0.8556	0,u^-	0	3	0	1	−1	7	1	3	8	61
		0,u^-	0	3	0	3	−1	5	1	3	8	30
9503.5	0.8557	2,u	0	3	0	1	1	7	1	3	8	31
		2,u	0	3	0	1	−1	7	3	3	8	56
9503.7	0.8859	2,u	0	0	0	13	1	5	1	0	18	34
9504.4	0.8862	2,g								0	18	<25
9505.6	0.8603	0,g^+	1	1	0	8	2	2	−2	2	10	29
9505.9	0.8602	0,u^+	1	1	0	9	1	1	−1	2	10	56
9506.0	0.8603	0,u^-	1	1	0	7	−1	3	1	2	10	32
9506.2	0.8766	1,u								1	15	<25
9506.6	0.8603	2,g								2	10	<25
9507.1	0.8394	1,u	1	3	0	0	0	3	1	4	3	98
9508.3	0.8603	0,g^+	1	1	0	6	2	4	−2	2	10	28
		0,g^+	1	1	0	8	0	2	0	2	10	32
9508.5	0.8518	1,u	0	2	1	7	1	0	0	3	7	60
9508.8	0.8519	1,g	0	2	1	4	−2	3	3	3	7	68
9508.9	0.8603	0,g^-	1	1	0	8	−2	2	2	2	10	56
9509.5	0.8602	2,u	1	1	0	9	3	1	−1	2	10	37
9509.8	0.8556	2,u	0	3	0	1	1	7	1	3	8	42
9511.6	0.8603	2,g	1	1	0	8	2	2	0	2	10	33
9511.6	0.8731	0,u^-	0	0	1	6	−6	8	6	1	14	44
9511.7	0.8882	1,u	0	0	0	10	10	9	−9	0	19	46
9513.2	0.8765	1,g								1	15	<25
9514.0	0.8602	2,u	1	1	0	9	1	1	1	2	10	36
9514.7	0.8519	1,g	0	2	1	4	2	3	−1	3	7	31
9515.3	0.8862	0,u^+	0	0	0	3	1	15	−1	0	18	38
9516.7	0.8766	1,g								1	15	<25
9517.4	0.8419	0,g^+	1	0	2	0	0	4	0	3	4	93
9517.8	0.8731	0,g^-	0	0	1	7	−7	7	7	1	14	57
9517.9	0.8766	1,u								1	15	<25
9518.0	0.8603	0,u^-	1	1	0	5	−3	5	3	2	10	26
		0,u^-	1	1	0	7	−3	3	3	2	10	34
9518.6	0.8883	1,g	0	0	0	9	−9	10	10	0	19	31
9519.1	0.8603	2,g	1	1	0	8	0	2	2	2	10	48
9519.3	0.8731	2,g	0	0	1	7	7	7	−5	1	14	25
9520.5	0.8458	1,g	0	4	0	5	1	0	0	4	5	94
9520.5	0.8580	1,g								2	9	<25

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9520.5	0.8357	$0,u^+$	1	2	1	2	0	0	0	4	2	98
9520.6	0.8603	$2,u$	1	1	0	5	−3	5	5	2	10	42
9520.8	0.8859	$2,g$	0	0	0	14	4	4	−2	0	18	34
9520.9	0.8860	$2,u$								0	18	<25
9522.8	0.8357	$2,u$	1	2	1	2	2	0	0	4	2	99
9523.5	0.8603	$0,u^+$	1	1	0	5	1	5	−1	2	10	38
9524.8	0.8375	$1,g$	3	0	0	1	1	2	0	3	3	55
		$1,g$	3	0	0	1	−1	2	2	3	3	43
9524.9	0.8419	$2,g$	1	0	2	0	0	4	2	3	4	94
9525.6	0.8906	$0,u^-$								0	20	<25
9525.6	0.8857	$0,g^-$	0	0	0	14	−2	4	2	0	18	83
9525.6	0.8906	$0,g^+$								0	20	<25
9526.6	0.8581	$1,u$	0	0	2	0	0	9	1	2	9	32
9526.7	0.8520	$1,u$	0	2	1	3	−3	4	4	3	7	89
9527.2	0.8519	$1,g$	0	2	1	6	0	1	1	3	7	35
9527.5	0.8604	$2,g$	1	1	0	4	−4	6	6	2	10	60
9527.8	0.8604	$0,g^-$	1	1	0	4	−4	6	4	2	10	53
9528.2	0.8731	$2,u$	0	0	1	6	−6	8	8	1	14	40
9528.2	0.8604	$0,g^+$	1	1	0	4	4	6	−4	2	10	51
9529.1	0.8857	$2,g$	0	0	0	14	−2	4	4	0	18	68
9529.8	0.8861	$0,g^+$								0	18	<25
9530.2	0.8520	$1,u$	0	2	1	3	3	4	−2	3	7	65
9530.5	0.8557	$0,g^+$	0	3	0	0	0	8	0	3	8	79
9530.7	0.8603	$0,u^+$	1	1	0	7	1	3	−1	2	10	28
9532.1	0.8858	$2,u$	0	0	0	15	5	3	−3	0	18	49
9532.2	0.8603	$2,u$								2	10	<25
9532.5	0.8883	$1,g$								0	19	<25
9532.8	0.8375	$1,g$	3	0	0	1	1	2	0	3	3	43
		$1,g$	3	0	0	1	−1	2	2	3	3	56
9532.9	0.8458	$1,u$	0	4	0	4	2	1	−1	4	5	65
		$1,u$	0	4	0	4	0	1	1	4	5	31
9533.9	0.8440	$1,g$	2	1	0	5	1	0	0	3	5	93
9534.0	0.8906	$2,g$								0	20	<25
9534.0	0.8906	$2,u$								0	20	<25
9534.6	0.8721	$0,u^-$	1	0	0	5	−1	9	1	1	14	29
9534.6	0.8721	$0,g^+$								1	14	<25
9534.9	0.8603	$2,u$	1	1	0	7	−1	3	3	2	10	26
9534.9	0.8883	$1,u$								0	19	<25
9536.6	0.8731	$0,g^+$								1	14	<25
9537.2	0.8766	$1,g$								1	15	<25
9537.5	0.8557	$2,g$	0	3	0	0	0	8	2	3	8	80
9538.8	0.8765	$1,u$	0	1	0	10	−4	5	5	1	15	26
9539.2	0.8520	$1,u$	0	2	1	3	−1	4	2	3	7	36
9539.7	0.8731	$0,u^-$								1	14	<25
9539.8	0.8603	$2,g$	1	1	0	4	4	6	−2	2	10	38
9539.9	0.8861	$2,g$								0	18	<25
9540.0	0.8601	$0,g^+$	1	1	0	10	0	0	0	2	10	78
9542.4	0.8721	$2,g$								1	14	<25
9542.4	0.8721	$2,u$								1	14	<25
9543.5	0.8601	$2,g$	1	1	0	10	2	0	0	2	10	63
9543.8	0.8861	$0,u^+$								0	18	<25
9544.7	0.8857	$0,g^+$	0	0	0	14	2	4	−2	0	18	30
		$0,g^+$	0	0	0	14	0	4	0	0	18	47
9544.9	0.8731	$2,u$								1	14	<25
9545.3	0.8731	$2,g$								1	14	<25
9547.4	0.8458	$1,u$	0	4	0	4	2	1	−1	4	5	29
		$1,u$	0	4	0	4	0	1	1	4	5	62
9547.8	0.8441	$1,u$	2	1	0	4	2	1	−1	3	5	65
		$1,u$	2	1	0	4	0	1	1	3	5	31
9547.9	0.8602	$0,u^-$	1	1	0	9	−1	1	1	2	10	64
9548.1	0.8764	$1,g$	0	1	0	11	5	4	−4	1	15	49
9549.8	0.8520	$1,u$	0	2	1	5	1	2	0	3	7	28
9549.9	0.8765	$1,u$								1	15	<25
9550.3	0.8603	$0,g^-$	1	1	0	2	−2	8	2	2	10	27

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,g^-$	1	1	0	6	−2	4	2	2	10	40
9550.9	0.8883	$1,u$								0	19	<25
9551.0	0.8731	$0,u^+$	0	0	1	8	6	6	−6	1	14	63
9552.4	0.8766	$1,g$								1	15	<25
9552.4	0.8604	$0,g^+$	1	1	0	4	2	6	−2	2	10	35
		$0,g^+$	1	1	0	4	0	6	0	2	10	31
9552.5	0.8602	$2,u$	1	1	0	9	1	1	1	2	10	47
9553.5	0.8358	$0,g^+$	1	2	1	1	1	1	−1	4	2	99
9553.8	0.8883	$1,g$								0	19	<25
9554.5	0.8766	$1,u$								1	15	<25
9554.8	0.8857	$2,g$	0	0	0	14	2	4	0	0	18	27
		$2,g$	0	0	0	14	0	4	2	0	18	45
9554.9	0.8861	$2,u$								0	18	<25
9555.0	0.8604	$2,g$	1	1	0	6	−2	4	4	2	10	26
9556.7	0.8459	$1,g$	0	4	0	3	3	2	−2	4	5	73
9557.7	0.8730	$2,g$	0	0	1	9	7	5	−5	1	14	51
9557.9	0.8856	$0,u^-$	0	0	0	15	−3	3	3	0	18	77
9558.8	0.8569	$1,u$								2	9	<25
9558.8	0.8569	$1,g$								2	9	<25
9559.7	0.8604	$2,g$	1	1	0	4	0	6	2	2	10	25
9560.7	0.8358	$0,g^-$	1	2	1	1	−1	1	1	4	2	99
9560.9	0.8521	$1,g$	0	2	1	2	0	5	1	3	7	27
		$1,g$	0	2	1	2	−2	5	3	3	7	44
9561.1	0.8860	$0,g^+$								0	18	<25
9561.8	0.8732	$0,g^+$	0	0	1	5	5	9	−5	1	14	43
9562.4	0.8441	$1,u$	2	1	0	4	2	1	−1	3	5	29
		$1,u$	2	1	0	4	0	1	1	3	5	62
9563.8	0.8358	$2,g$	1	2	1	1	1	1	1	4	2	99
9564.0	0.8766	$1,g$								1	15	<25
9564.1	0.8765	$1,u$								1	15	<25
9565.2	0.8857	$0,u^+$	0	0	0	15	3	3	−3	0	18	64
9565.3	0.8766	$1,u$								1	15	<25
9565.3	0.8459	$1,g$	0	4	0	3	−1	2	2	4	5	54
9565.5	0.8520	$1,g$	0	2	1	2	2	5	−1	3	7	44
		$1,g$	0	2	1	2	−2	5	3	3	7	32
9565.5	0.8731	$0,u^+$	0	0	1	6	6	8	−6	1	14	53
9565.6	0.8603	$0,g^+$	1	1	0	8	0	2	0	2	10	28
9565.8	0.8766	$1,g$								1	15	<25
9566.1	0.8605	$0,u^-$	1	1	0	3	−3	7	3	2	10	58
9566.9	0.8731	$0,u^-$	0	0	1	8	−6	6	6	1	14	62
9566.9	0.8731	$0,g^-$	0	0	1	7	−5	7	5	1	14	27
9567.7	0.8672	$0,u^-$	0	2	0	5	−1	7	1	2	12	29
9567.7	0.8672	$0,g^+$								2	12	<25
9568.5	0.8604	$0,u^+$	1	1	0	3	3	7	−3	2	10	50
9568.7	0.8731	$2,g$								1	14	<25
9568.8	0.8860	$2,g$								0	18	<25
9569.0	0.8605	$2,u$	1	1	0	3	−3	7	5	2	10	61
9570.5	0.8732	$2,u$								1	14	<25
9570.6	0.8766	$1,u$	0	1	0	10	2	5	−1	1	15	31
9570.7	0.8603	$2,g$								2	10	<25
9572.8	0.8441	$1,g$	2	1	0	3	3	2	−2	3	5	73
9573.4	0.8569	$1,u$	1	0	1	5	5	4	−4	2	9	45
9573.5	0.8731	$2,u$	0	0	1	8	6	6	−4	1	14	28
9574.1	0.8569	$1,g$	1	0	1	6	4	3	−3	2	9	35
9575.0	0.8672	$2,u$								2	12	<25
9575.0	0.8672	$2,g$								2	12	<25
9575.5	0.8376	$1,u$	3	0	0	0	0	3	1	3	3	98
9575.7	0.8766	$1,g$								1	15	<25
9575.8	0.8520	$1,g$								3	7	<25
9576.1	0.8459	$1,g$	0	4	0	3	1	2	0	4	5	47
		$1,g$	0	4	0	3	−1	2	2	4	5	35
9578.0	0.8604	$2,u$	1	1	0	3	3	7	−1	2	10	46
9580.6	0.8860	$0,u^+$	0	0	0	15	1	3	−1	0	18	31
9581.0	0.8569	$1,u$	1	0	1	5	5	4	−4	2	9	45

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9581.2	0.8731	2,*g*	0	0	1	5	−5	9	7	1	14	33
9581.2	0.8605	0,u^+	1	1	0	3	1	7	−1	2	10	53
9581.6	0.8441	1,*g*	2	1	0	3	−1	2	2	3	5	53
9582.0	0.8299	0,g^+	0	0	4	0	0	0	0	4	0	97
9582.6	0.8858	2,*u*	0	0	0	15	3	3	−1	0	18	46
9583.1	0.8764	1,*g*								1	15	<25
9583.5	0.8568	1,*g*	1	0	1	6	2	3	−1	2	9	26
9585.4	0.8767	1,*u*								1	15	<25
9587.4	0.8568	1,*u*								2	9	<25
9587.7	0.8605	2,*u*	1	1	0	3	1	7	1	2	10	27
		2,*u*	1	1	0	3	−1	7	3	2	10	30
9587.9	0.8766	1,*g*								1	15	<25
9588.0	0.8604	0,u^-	1	1	0	1	−1	9	1	2	10	29
		0,u^-	1	1	0	7	−1	3	1	2	10	33
9588.4	0.8732	0,u^+	0	0	1	8	4	6	−4	1	14	26
9589.3	0.8883	1,*u*								0	19	<25
9590.4	0.8858	2,*u*	0	0	0	15	−1	3	3	0	18	38
9590.8	0.8882	1,*g*	0	0	0	11	9	8	−8	0	19	27
9591.4	0.8861	0,g^+								0	18	<25
9591.9	0.8764	1,*u*	0	1	0	10	0	5	1	1	15	26
9592.5	0.8441	1,*g*	2	1	0	3	1	2	0	3	5	47
		1,*g*	2	1	0	3	−1	2	2	3	5	36
9593.0	0.8568	1,*g*	1	0	1	6	0	3	1	2	9	26
9593.9	0.8604	2,*u*								2	10	<25
9594.1	0.8521	1,*u*	0	2	1	1	1	6	0	3	7	39
		1,*u*	0	2	1	1	−1	6	2	3	7	48
9594.7	0.8460	1,*u*	0	4	0	2	2	3	−1	4	5	37
		1,*u*	0	4	0	2	0	3	1	4	5	32
		1,*u*	0	4	0	2	−2	3	3	4	5	28
9595.8	0.8731	0,g^+	0	0	1	9	5	5	−5	1	14	37
9595.8	0.8732	0,g^-								1	14	<25
9597.0	0.8766	1,*u*								1	15	<25
9597.7	0.8764	1,*g*	0	1	0	11	−3	4	4	1	15	33
9597.8	0.8860	2,*g*								0	18	<25
9598.3	0.8732	2,*g*								1	14	<25
9599.2	0.8359	0,u^+	1	2	1	0	0	2	0	4	2	98
9599.3	0.8731	2,*u*								1	14	<25
9599.8	0.8460	1,*u*	0	4	0	2	2	3	−1	4	5	39
		1,*u*	0	4	0	2	−2	3	3	4	5	59
9601.4	0.8859	0,u^+								0	18	<25
9602.3	0.8856	0,u^-	0	0	0	15	−1	3	1	0	18	86
9602.3	0.8731	0,u^+								1	14	<25
9602.6	0.8569	1,*u*	1	0	1	5	−3	4	4	2	9	49
9603.2	0.8484	0,u^+	0	1	2	5	1	1	−1	3	6	78
9603.3	0.8605	0,g^-	1	1	0	2	−2	8	2	2	10	57
		0,g^-	1	1	0	4	−2	6	2	2	10	31
9603.5	0.8521	1,*u*	0	2	1	1	1	6	0	3	7	35
		1,*u*	0	2	1	1	−1	6	2	3	7	29
9604.4	0.8484	0,g^+	0	1	2	4	0	2	0	3	6	46
		0,g^+	0	1	2	6	0	0	0	3	6	40
9604.8	0.8484	2,*u*	0	1	2	5	3	1	−1	3	6	68
9606.0	0.8764	1,*u*								1	15	<25
9606.1	0.8731	2,*u*								1	14	<25
9606.7	0.8606	0,g^+	1	1	0	2	2	8	−2	2	10	55
		0,g^+	1	1	0	2	0	8	0	2	10	26
9607.1	0.8484	2,*g*	0	1	2	4	4	2	−2	3	6	25
		2,*g*	0	1	2	4	2	2	0	3	6	39
		2,*g*	0	1	2	6	2	0	0	3	6	31
9607.3	0.8359	2,*u*	1	2	1	0	0	2	2	4	2	99
9607.8	0.8858	2,*u*	0	0	0	15	−1	3	3	0	18	26
9608.3	0.8605	2,*g*	1	1	0	2	−2	8	4	2	10	57
9608.5	0.8721	0,u^+								1	14	<25
9608.6	0.8731	2,*g*								1	14	<25
9608.7	0.8721	0,g^-								1	14	<25

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9609.0	0.8460	1,u	0	4	0	2	0	3	1	4	5	55
9609.5	0.8569	1,g	1	0	1	4	−4	5	5	2	9	73
9610.3	0.8567	1,g	1	0	1	8	2	1	−1	2	9	45
9611.6	0.8484	2,g	0	1	2	4	4	2	−2	3	6	69
9612.0	0.8765	1,g								1	15	<25
9612.2	0.8568	1,u	1	0	1	7	3	2	−2	2	9	42
9612.3	0.8442	1,u	2	1	0	2	2	3	−1	3	5	37
		1,u	2	1	0	2	0	3	1	3	5	32
		1,u	2	1	0	2	−2	3	3	3	5	27
9612.6	0.8882	1,u								0	19	<25
9612.7	0.8484	0,u^-	0	1	2	3	−1	3	1	3	6	39
		0,u^-	0	1	2	5	−1	1	1	3	6	55
9612.9	0.8857	2,u	0	0	0	15	1	3	1	0	18	54
9613.3	0.8883	1,g								0	19	<25
9613.8	0.8605	0,g^+								2	10	<25
9613.9	0.8484	0,g^+	0	1	2	4	2	2	−2	3	6	69
9614.0	0.8856	2,g	0	0	0	16	4	2	−2	0	18	61
9614.1	0.8766	1,g								1	15	<25
9614.4	0.8671	0,g^-								2	12	<25
9614.7	0.8605	2,g	1	1	0	2	2	8	0	2	10	50
9614.7	0.8730	0,g^-	0	0	1	7	−5	7	5	1	14	27
		0,g^-	0	0	1	9	−5	5	5	1	14	54
9614.9	0.8671	0,u^+	0	2	0	5	3	7	−3	2	12	28
9615.5	0.8721	2,g								1	14	<25
9615.9	0.8721	2,u								1	14	<25
9616.5	0.8730	0,g^+	0	0	1	7	5	7	−5	1	14	32
		0,g^+	0	0	1	9	5	5	−5	1	14	39
9616.8	0.8484	0,g^-	0	1	2	4	−2	2	2	3	6	82
9617.1	0.8568	1,u	1	0	1	7	1	2	0	2	9	35
9617.4	0.8442	1,u	2	1	0	2	2	3	−1	3	5	39
		1,u	2	1	0	2	−2	3	3	3	5	58
9617.6	0.8484	2,u	0	1	2	3	1	3	1	3	6	30
		2,u	0	1	2	5	1	1	1	3	6	50
9618.1	0.8764	1,u	0	1	0	12	4	3	−3	1	15	35
9618.2	0.8568	1,g	1	0	1	8	0	1	1	2	9	28
9618.4	0.8729	2,u	0	0	1	10	6	4	−4	1	14	69
9618.6	0.8882	1,g	0	0	0	11	9	8	−8	0	19	31
9618.8	0.8671	2,u	0	2	0	7	7	5	−5	2	12	28
9618.9	0.8569	1,g	1	0	1	4	4	5	−3	2	9	27
9620.2	0.8732	0,u^-	0	0	1	6	−4	8	4	1	14	45
9620.3	0.8605	2,g								2	10	<25
9620.5	0.8671	2,g								2	12	<25
9621.2	0.8568	1,u	1	0	1	7	−1	2	2	2	9	54
9621.4	0.8883	1,u	0	0	0	8	−8	11	9	0	19	35
9621.8	0.8731	0,g^-								1	14	<25
9622.4	0.8731	0,u^-	0	0	1	8	−4	6	4	1	14	39
9624.8	0.8484	2,g	0	1	2	4	0	2	2	3	6	58
9625.5	0.8765	1,g								1	15	<25
9626.6	0.8442	1,u	2	1	0	2	0	3	1	3	5	56
9626.7	0.8298	0,g^+	1	4	0	0	0	0	0	5	0	99
9627.0	0.8522	1,g	0	2	1	0	0	7	1	3	7	80
9627.4	0.8732	2,u	0	0	1	6	−4	8	6	1	14	31
9627.4	0.8485	0,u^+	0	1	2	3	3	3	−3	3	6	80
9627.5	0.8856	0,g^+	0	0	0	16	2	2	−2	0	18	43
9628.0	0.8731	2,g								1	14	<25
9628.2	0.8789	0,u^-	0	1	0	5	−1	11	1	1	16	28
9628.2	0.8789	0,g^+								1	16	<25
9628.9	0.8485	0,u^-	0	1	2	3	−3	3	3	3	6	96
9629.5	0.8484	0,g^+	0	1	2	6	0	0	0	3	6	40
9630.2	0.8731	2,g								1	14	<25
9630.4	0.8855	0,g^-	0	0	0	16	−2	2	2	0	18	94
9631.9	0.8731	2,u								1	14	<25
9632.8	0.8766	1,u	0	1	0	0	0	15	1	1	15	25
9633.0	0.8765	1,g								1	15	<25

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9633.1	0.8765	1,u								1	15	<25
9633.4	0.8484	2,g	0	1	2	6	2	0	0	3	6	30
9633.9	0.8731	0,g^+	0	0	1	9	3	5	−3	1	14	44
9634.0	0.8569	1,g	1	0	1	4	−2	5	3	2	9	26
9636.3	0.8789	2,g								1	16	<25
9636.3	0.8789	2,u								1	16	<25
9636.3	0.8765	1,u	0	1	0	12	−2	3	3	1	15	34
9636.7	0.8461	1,g	0	4	0	1	1	4	0	4	5	49
		1,g	0	4	0	1	−1	4	2	4	5	47
9637.1	0.8606	0,u^+	1	1	0	1	1	9	−1	2	10	79
9637.2	0.8670	2,u	0	2	0	7	7	5	−5	2	12	60
9637.3	0.8765	1,g	0	1	0	11	−1	4	2	1	15	26
9637.6	0.8485	2,u	0	1	2	3	3	3	−1	3	6	53
9638.0	0.8731	0,u^+	0	0	1	6	4	8	−4	1	14	31
9638.1	0.8485	0,u^+	0	1	2	3	1	3	−1	3	6	51
9639.1	0.8568	1,g								2	9	<25
9639.6	0.8671	0,g^+	0	2	0	6	6	6	−6	2	12	62
9640.9	0.8605	0,u^-	1	1	0	1	−1	9	1	2	10	41
		0,u^-	1	1	0	3	−1	7	1	2	10	34
9641.0	0.8732	0,g^-								1	14	<25
9641.2	0.8766	1,u								1	15	<25
9641.5	0.8566	1,u	1	0	1	9	1	0	0	2	9	73
9641.7	0.8731	2,u								1	14	<25
9641.8	0.8731	0,u^-	0	0	1	4	−4	10	4	1	14	28
		0,u^-	0	0	1	8	−2	6	2	1	14	31
9643.0	0.8731	2,g								1	14	<25
9643.3	0.8606	2,u	1	1	0	1	−1	9	3	2	10	56
9643.7	0.8485	2,u	0	1	2	3	−1	3	3	3	6	66
9644.7	0.8855	2,g	0	0	0	16	2	2	0	0	18	39
		2,g	0	0	0	16	0	2	2	0	18	30
9644.9	0.8461	1,g	0	4	0	1	1	4	0	4	5	44
		1,g	0	4	0	1	−1	4	2	4	5	47
9645.4	0.8671	0,u^-	0	2	0	5	−5	7	5	2	12	38
		0,u^-	0	2	0	7	−5	5	5	2	12	34
9647.7	0.8570	1,u	1	0	1	3	−3	6	4	2	9	62
9648.3	0.8605	2,u	1	1	0	1	1	9	1	2	10	39
9648.7	0.8767	1,g	0	1	0	5	1	10	0	1	15	37
		1,g	0	1	0	5	−1	10	2	1	15	30
9649.5	0.8731	2,g								1	14	<25
9649.5	0.8485	0,u^-	0	1	2	1	−1	5	1	3	6	26
		0,u^-	0	1	2	3	−1	3	1	3	6	31
		0,u^-	0	1	2	5	−1	1	1	3	6	41
9650.2	0.8671	2,g	0	2	0	6	6	6	−4	2	12	29
9651.3	0.8406	0,u^+	2	0	1	4	0	0	0	3	4	95
9651.9	0.8732	2,u								1	14	<25
9652.0	0.8720	0,u^-	1	0	0	7	−7	7	7	1	14	40
9652.7	0.8882	1,g								0	19	<25
9653.0	0.8570	1,u	1	0	1	3	3	6	−2	2	9	50
9653.6	0.8406	2,u	2	0	1	4	2	0	0	3	4	96
9654.1	0.8671	0,g^-	0	2	0	6	−6	6	6	2	12	80
9654.3	0.8485	2,u	0	1	2	3	1	3	1	3	6	27
		2,u	0	1	2	5	1	1	1	3	6	29
9654.4	0.8720	2,g	1	0	0	8	8	6	−6	1	14	55
9655.1	0.8568	1,g	1	0	1	8	0	1	1	2	9	33
9655.8	0.8443	1,g	2	1	0	1	1	4	0	3	5	49
		1,g	2	1	0	1	−1	4	2	3	5	47
9655.9	0.8485	0,g^+	0	1	2	2	2	4	−2	3	6	61
		0,g^+	0	1	2	2	0	4	0	3	6	28
9656.3	0.8323	1,g	1	1	2	1	1	0	0	4	1	97
9656.4	0.8720	0,g^+	1	0	0	6	6	8	−6	1	14	33
9656.5	0.8764	1,u	0	1	0	12	2	3	−1	1	15	30
9656.7	0.8883	1,u	0	0	0	10	−8	9	9	0	19	25
9656.7	0.8729	0,u^+	0	0	1	10	4	4	−4	1	14	47
9657.6	0.8762	1,g	0	1	0	13	3	2	−2	1	15	48

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9658.1	0.8731	$0,g^-$	0	0	1	9	−3	5	3	1	14	52
9658.3	0.8768	$1,u$	0	1	0	4	0	11	1	1	15	34
9660.4	0.8730	$0,u^-$	0	0	1	10	−4	4	4	1	14	40
9661.6	0.8855	$0,g^+$	0	0	0	16	2	2	−2	0	18	35
		$0,g^+$	0	0	0	16	0	2	0	0	18	61
9661.7	0.8769	$1,g$								1	15	<25
9661.8	0.8485	$0,g^-$	0	1	2	2	−2	4	2	3	6	82
9662.2	0.8769	$1,u$	0	1	0	0	0	15	1	1	15	25
		$1,u$	0	1	0	2	2	13	−1	1	15	26
9662.5	0.8730	$2,g$	0	0	1	9	−3	5	5	1	14	30
9662.6	0.8569	$1,u$								2	9	<25
9662.7	0.8720	$2,u$	1	0	0	7	7	7	−5	1	14	28
9662.7	0.8486	$2,g$	0	1	2	2	−2	4	4	3	6	62
9663.3	0.8671	$2,u$								2	12	<25
9663.4	0.8730	$2,u$								1	14	<25
9663.8	0.8443	$1,g$	2	1	0	1	1	4	0	3	5	43
		$1,g$	2	1	0	1	−1	4	2	3	5	48
9663.8	0.8607	$0,g^+$	1	1	0	0	0	10	0	2	10	67
9665.0	0.8731	$0,u^-$	0	0	1	10	−4	4	4	1	14	28
9665.3	0.8423	$0,u^+$	0	3	1	4	0	0	0	4	4	95
9667.7	0.8423	$2,u$	0	3	1	4	2	0	0	4	4	96
9667.9	0.8485	$2,g$	0	1	2	2	2	4	0	3	6	42
		$2,g$	0	1	2	2	−2	4	4	3	6	32
9667.9	0.8730	$2,g$								1	14	<25
9668.6	0.8406	$0,g^+$	2	0	1	3	1	1	−1	3	4	97
9669.3	0.8855	$2,g$	0	0	0	16	2	2	0	0	18	38
		$2,g$	0	0	0	16	0	2	2	0	18	55
9669.9	0.8730	$0,g^+$	0	0	1	9	1	5	−1	1	14	35
9670.1	0.8406	$2,g$	2	0	1	3	3	1	−1	3	4	83
9670.7	0.8607	$2,g$	1	1	0	0	0	10	2	2	10	67
9671.5	0.8671	$0,u^+$	0	2	0	7	5	5	−5	2	12	50
9671.7	0.8671	$0,g^+$								2	12	<25
9672.5	0.8485	$0,g^+$	0	1	2	2	0	4	0	3	6	27
9673.9	0.8671	$0,u^-$	0	2	0	7	−1	5	1	2	12	28
9674.6	0.8769	$1,g$	0	1	0	3	−1	12	2	1	15	27
9674.8	0.8569	$1,u$								2	9	<25
9674.8	0.8732	$0,u^+$	0	0	1	0	0	14	0	1	14	26
9675.5	0.8721	$0,u^-$								1	14	<25
9675.5	0.8720	$0,u^+$	1	0	0	7	7	7	−7	1	14	80
9676.1	0.8768	$1,u$	0	1	0	2	0	13	1	1	15	44
9676.3	0.8765	$1,g$								1	15	<25
9676.8	0.8671	$0,g^+$								2	12	<25
9677.0	0.8721	$0,g^+$								1	14	<25
9677.3	0.8720	$2,g$								1	14	<25
9677.9	0.8485	$2,g$	0	1	2	2	0	4	2	3	6	29
9677.9	0.8731	$2,u$								1	14	<25
9678.5	0.8671	$2,g$								2	12	<25
9678.5	0.8730	$2,g$	0	0	1	11	5	3	−3	1	14	41
9678.9	0.8731	$0,g^-$	0	0	1	9	−1	5	1	1	14	27
9679.5	0.8670	$2,g$	0	2	0	8	6	4	−4	2	12	28
9679.7	0.8883	$1,u$								0	19	<25
9680.3	0.8671	$2,u$								2	12	<25
9680.8	0.8407	$0,g^-$	2	0	1	3	−1	1	1	3	4	94
9680.9	0.8461	$1,u$	0	4	0	0	0	5	1	4	5	94
9681.2	0.8424	$0,g^+$	0	3	1	3	1	1	−1	4	4	97
9681.5	0.8762	$1,g$	0	1	0	13	−1	2	2	1	15	55
9682.4	0.8883	$1,g$								0	19	<25
9682.5	0.8570	$1,g$	1	0	1	2	−2	7	3	2	9	50
9682.6	0.8732	$2,u$								1	14	<25
9682.7	0.8507	$1,u$	1	2	0	6	2	1	−1	3	7	59
		$1,u$	1	2	0	6	0	1	1	3	7	26
9682.7	0.8730	$0,g^+$	0	0	1	7	1	7	−1	1	14	30
		$0,g^+$	0	0	1	9	1	5	−1	1	14	26
9682.8	0.8424	$2,g$	0	3	1	3	3	1	−1	4	4	84

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9683.4	0.8721	2,*u*								1	14	<25
9683.7	0.8507	1,*g*	1	2	0	5	1	2	0	3	7	30
		1,*g*	1	2	0	7	1	0	0	3	7	64
9683.8	0.8730	$0,u^+$	0	0	1	8	2	6	−2	1	14	35
		$0,u^+$	0	0	1	8	0	6	0	1	14	39
9684.3	0.8732	2,*g*								1	14	<25
9684.3	0.8406	2,*g*	2	0	1	3	1	1	1	3	4	79
9684.6	0.8854	2,*u*	0	0	0	17	3	1	−1	0	18	70
9685.9	0.8570	1,*g*	1	0	1	2	2	7	−1	2	9	46
9686.0	0.8854	$0,u^+$	0	0	0	17	1	1	−1	0	18	88
9686.2	0.8486	$0,u^+$	0	1	2	1	1	5	−1	3	6	86
9687.1	0.8721	2,*g*								1	14	<25
9688.3	0.8670	2,*g*	0	2	0	6	6	6	−4	2	12	31
9688.4	0.8731	$0,g^-$	0	0	1	5	−3	9	3	1	14	27
9688.9	0.8671	2,*u*	0	2	0	5	−5	7	7	2	12	42
9690.1	0.8731	$0,u^+$	0	0	1	6	0	8	0	1	14	34
9691.4	0.8731	2,*u*								1	14	<25
9691.4	0.8731	$0,g^+$	0	0	1	7	1	7	−1	1	14	35
9692.1	0.8882	1,*g*	0	0	0	9	−7	10	8	0	19	29
9692.4	0.8730	2,*g*								1	14	<25
9692.9	0.8508	1,*g*	1	2	0	5	3	2	−2	3	7	75
9693.2	0.8486	2,*u*	0	1	2	1	1	5	1	3	6	35
		2,*u*	0	1	2	1	−1	5	3	3	6	54
9693.3	0.8424	$0,g^-$	0	3	1	3	−1	1	1	4	4	94
9694.3	0.8731	$0,u^-$	0	0	1	10	−2	4	2	1	14	44
9694.5	0.8882	1,*u*								0	19	<25
9694.8	0.8670	$0,g^-$	0	2	0	8	−4	4	4	2	12	47
9695.0	0.8670	$0,u^+$	0	2	0	5	5	7	−5	2	12	33
9695.5	0.8507	1,*u*	1	2	0	6	0	1	1	3	7	46
9695.7	0.8670	$0,u^-$	0	2	0	7	−5	5	5	2	12	58
9696.0	0.8730	$0,u^+$	0	0	1	10	0	4	0	1	14	25
9696.4	0.8720	$0,g^-$	1	0	0	6	−6	8	6	1	14	33
		$0,g^-$	1	0	0	8	−6	6	6	1	14	37
9696.5	0.8323	1,*u*	1	1	2	0	0	1	1	4	1	97
9696.9	0.8424	2,*g*	0	3	1	3	1	1	1	4	4	79
9697.1	0.8764	1,*u*								1	15	<25
9697.2	0.8729	2,*u*	0	0	1	10	−2	4	4	1	14	28
9697.3	0.8407	$0,u^+$	2	0	1	2	2	2	−2	3	4	64
		$0,u^+$	2	0	1	2	0	2	0	3	4	33
9697.3	0.8486	$0,u^-$	0	1	2	1	−1	5	1	3	6	68
		$0,u^-$	0	1	2	3	−1	3	1	3	6	28
9697.5	0.8570	1,*g*	1	0	1	0	0	9	1	2	9	25
9698.6	0.8364	$0,g^+$	0	5	0	2	0	0	0	5	2	99
9699.3	0.8670	2,*u*	0	2	0	9	5	3	−3	2	12	33
9699.9	0.8731	2,*g*								1	14	<25
9700.5	0.8731	$0,g^+$	0	0	1	5	1	9	−1	1	14	40
9700.9	0.8364	2,*g*	0	5	0	2	2	0	0	5	2	100
9700.9	0.8730	2,*u*								1	14	<25
9701.3	0.8444	1,*u*	2	1	0	0	0	5	1	3	5	94
9701.8	0.8720	$0,u^-$	1	0	0	7	−7	7	7	1	14	48
9702.6	0.8407	$0,u^-$	2	0	1	2	−2	2	2	3	4	99
9702.7	0.8508	1,*g*	1	2	0	5	−1	2	2	3	7	61
9703.4	0.8486	2,*u*	0	1	2	1	1	5	1	3	6	41
		2,*u*	0	1	2	1	−1	5	3	3	6	30
9703.6	0.8731	2,*g*								1	14	<25
9704.0	0.8884	1,*u*								0	19	<25
9704.1	0.8720	2,*u*								1	14	<25
9704.6	0.8730	$0,g^+$	0	0	1	11	1	3	−1	1	14	35
9706.2	0.8670	2,*g*	0	2	0	8	4	4	−2	2	12	34
9706.3	0.8407	2,*u*	2	0	1	2	2	2	0	3	4	67
		2,*u*	2	0	1	2	0	2	2	3	4	30
9706.3	0.8731	2,*u*								1	14	<25
9707.0	0.8761	1,*u*	0	1	0	14	2	1	−1	1	15	56
		1,*u*	0	1	0	14	0	1	1	1	15	37

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9707.1	0.8508	1,u	1	2	0	4	4	3	−3	3	7	94
9707.2	0.8670	0,g^-	0	2	0	6	−2	6	2	2	12	30
		0,g^-	0	2	0	8	−2	4	2	2	12	28
9707.6	0.8883	1,g								0	19	<25
9708.0	0.8637	1,g								2	11	<25
9708.0	0.8637	1,u								2	11	<25
9708.2	0.8670	0,g^+	0	2	0	8	4	4	−4	2	12	62
9708.3	0.8728	0,g^-	0	0	1	11	−3	3	3	1	14	72
9708.5	0.8905	0,u^+								0	20	<25
9708.5	0.8905	0,g^-								0	20	<25
9708.5	0.8425	0,u^+	0	3	1	2	2	2	−2	4	4	65
		0,u^+	0	3	1	2	0	2	0	4	4	33
9708.7	0.8670	0,u^-	0	2	0	5	−5	7	5	2	12	31
9708.8	0.8733	0,u^+	0	0	1	4	2	10	−2	1	14	26
9710.7	0.8732	2,g	0	0	1	5	1	9	1	1	14	29
9711.5	0.8671	0,u^+	0	2	0	7	3	5	−3	2	12	28
9711.9	0.8407	0,u^+	2	0	1	2	2	2	−2	3	4	34
		0,u^+	2	0	1	2	0	2	0	3	4	58
9712.1	0.8508	1,g	1	2	0	5	1	2	0	3	7	28
9712.2	0.8571	1,u	1	0	1	1	1	8	0	2	9	34
		1,u	1	0	1	1	−1	8	2	2	9	43
9713.8	0.8720	2,g	1	0	0	6	−6	8	8	1	14	41
9713.9	0.8425	0,u^-	0	3	1	2	−2	2	2	4	4	100
9715.2	0.8734	0,g^+	0	0	1	1	1	13	−1	1	14	37
		0,g^+	0	0	1	3	3	11	−3	1	14	27
		0,g^+	0	0	1	3	1	11	−1	1	14	25
9715.5	0.8670	2,u								2	12	<25
9716.1	0.8670	2,g								2	12	<25
9716.2	0.8882	1,g	0	0	0	11	−7	8	8	0	19	46
9716.8	0.8905	2,u								0	20	<25
9716.8	0.8905	2,g								0	20	<25
9717.0	0.8407	2,u	2	0	1	2	2	2	0	3	4	28
		2,u	2	0	1	2	0	2	2	3	4	67
9717.2	0.8733	2,u								1	14	<25
9717.5	0.8670	2,u								2	12	<25
9717.6	0.8425	2,u	0	3	1	2	2	2	0	4	4	67
		2,u	0	3	1	2	0	2	2	4	4	31
9717.6	0.8487	0,g^+	0	1	2	0	0	6	0	3	6	80
9718.4	0.8881	1,u	0	0	0	12	8	7	−7	0	19	52
9719.0	0.8854	0,u^-	0	0	0	17	−1	1	1	0	18	98
9719.8	0.8734	0,u^+	0	0	1	0	0	14	0	1	14	38
9720.2	0.8508	1,u	1	2	0	4	−2	3	3	3	7	54
9721.1	0.8720	0,u^+								1	14	<25
9721.3	0.8762	1,g	0	1	0	13	1	2	0	1	15	44
9722.3	0.8570	1,u								2	9	<25
9722.4	0.8728	2,g	0	0	1	11	1	3	1	1	14	27
9723.0	0.8719	2,u	1	0	0	9	7	5	−5	1	14	44
9723.0	0.8720	0,g^-	1	0	0	6	−6	8	6	1	14	26
9723.1	0.8425	0,u^+	0	3	1	2	2	2	−2	4	4	34
		0,u^+	0	3	1	2	0	2	0	4	4	58
9723.5	0.8734	2,g								1	14	<25
9724.1	0.8854	2,u	0	0	0	17	1	1	1	0	18	75
9724.3	0.8732	2,u	0	0	1	0	0	14	2	1	14	26
9724.3	0.8449	1,g	0	0	3	4	2	1	−1	3	5	58
		1,g	0	0	3	4	0	1	1	3	5	28
9724.6	0.8487	2,g	0	1	2	0	0	6	2	3	6	82
9724.7	0.8449	1,u	0	0	3	3	1	2	0	3	5	34
		1,u	0	0	3	5	1	0	0	3	5	59
9725.0	0.8670	2,g								2	12	<25
9725.4	0.8508	1,u	1	2	0	4	2	3	−1	3	7	35
		1,u	1	2	0	4	−2	3	3	3	7	31
9725.5	0.8670	0,g^-	0	2	0	8	−4	4	4	2	12	34
9725.6	0.8731	0,u^-								1	14	<25
9725.8	0.8670	2,u								2	12	<25

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9728.2	0.8425	2,*u*	0	3	1	2	2	2	0	4	4	29
		2,*u*	0	3	1	2	0	2	2	4	4	66
9728.2	0.8720	2,*g*								1	14	<25
9729.9	0.8720	0,g^+	1	0	0	8	6	6	−6	1	14	69
9730.5	0.8730	2,*u*	0	0	1	12	4	2	−2	1	14	38
9731.1	0.8670	0,g^+	0	2	0	8	2	4	−2	2	12	42
		0,g^+	0	2	0	8	0	4	0	2	12	34
9731.2	0.8733	0,u^+	0	0	1	2	0	12	0	1	14	36
9731.4	0.8669	0,u^+	0	2	0	9	3	3	−3	2	12	33
		0,u^+	0	2	0	9	1	3	−1	2	12	44
9732.6	0.8670	0,u^-	0	2	0	5	−3	7	3	2	12	29
		0,u^-	0	2	0	9	−3	3	3	2	12	34
9733.2	0.8731	0,g^+	0	0	1	3	1	11	−1	1	14	25
9733.9	0.8731	0,g^-	0	0	1	11	−1	3	1	1	14	28
9734.8	0.8788	0,g^-								1	16	<25
9734.9	0.8788	0,u^+								1	16	<25
9735.5	0.8449	1,*g*	0	0	3	4	0	1	1	3	5	46
9735.5	0.8449	1,*u*	0	0	3	3	3	2	−2	3	5	79
9736.0	0.8720	2,*u*								1	14	<25
9736.2	0.8508	1,*u*	1	2	0	4	0	3	1	3	7	26
9736.9	0.8408	0,g^+	2	0	1	1	1	3	−1	3	4	97
9737.0	0.8727	0,u^+	0	0	1	12	2	2	−2	1	14	53
		0,u^+	0	0	1	12	0	2	0	1	14	39
9737.0	0.8365	0,u^+	0	5	0	1	1	1	−1	5	2	100
9737.3	0.8732	2,*u*								1	14	<25
9738.2	0.8882	1,*g*	0	0	0	11	7	8	−6	0	19	30
9738.8	0.8730	2,*g*								1	14	<25
9738.9	0.8731	2,*u*								1	14	<25
9739.7	0.8572	1,*g*	1	0	1	0	0	9	1	2	9	63
9740.0	0.8670	2,*u*								2	12	<25
9740.7	0.8670	0,u^+	0	2	0	7	1	5	−1	2	12	49
9741.2	0.8732	2,*g*	0	0	1	3	−1	11	3	1	14	25
9742.0	0.8450	1,*u*	0	0	3	3	−1	2	2	3	5	64
9742.2	0.8669	2,*g*	0	2	0	10	4	2	−2	2	12	36
9742.6	0.8670	0,g^+	0	2	0	6	4	6	−4	2	12	34
9742.7	0.8788	2,*u*								1	16	<25
9742.7	0.8788	2,*g*								1	16	<25
9743.2	0.8731	0,g^+								1	14	<25
9743.4	0.8670	2,*g*								2	12	<25
9743.5	0.8883	1,*u*	0	0	0	8	−6	11	7	0	19	30
9744.2	0.8365	0,u^-	0	5	0	1	−1	1	1	5	2	100
9744.3	0.8509	1,*g*	1	2	0	3	−3	4	4	3	7	87
9745.0	0.8408	2,*g*	2	0	1	1	1	3	1	3	4	54
		2,*g*	2	0	1	1	−1	3	3	3	4	43
9745.5	0.8636	1,*g*								2	11	<25
9745.7	0.8882	1,*u*								0	19	<25
9745.8	0.8408	0,g^-	2	0	1	1	−1	3	1	3	4	94
9746.0	0.8636	1,*u*								2	11	<25
9746.2	0.8720	0,g^-	1	0	0	8	−6	6	6	1	14	46
9746.5	0.8509	1,*g*	1	2	0	3	3	4	−2	3	7	72
9746.7	0.8425	0,g^+	0	3	1	1	1	3	−1	4	4	97
9747.3	0.8365	2,*u*	0	5	0	1	1	1	1	5	2	100
9747.9	0.8720	0,u^+	1	0	0	5	5	9	−5	1	14	31
		0,u^+	1	0	0	7	5	7	−5	1	14	25
9748.1	0.8883	1,*g*								0	19	<25
9748.2	0.8720	0,u^-	1	0	0	9	−5	5	5	1	14	41
9748.4	0.8761	1,*u*	0	1	0	14	2	1	−1	1	15	35
		1,*u*	0	1	0	14	0	1	1	1	15	58
9748.4	0.8670	2,*u*	0	2	0	7	−1	5	3	2	12	30
9750.2	0.8670	0,g^+	0	2	0	6	2	6	−2	2	12	28
		0,g^+	0	2	0	10	2	2	−2	2	12	33
9750.3	0.8670	2,*g*								2	12	<25
9750.5	0.8720	0,g^+	1	0	0	6	6	8	−6	1	14	46
9750.7	0.8670	0,g^-	0	2	0	4	−4	8	4	2	12	31

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,g^-$	0	2	0	10	−2	2	2	2	12	28
9750.9	0.8670	$0,u^-$								2	12	<25
9751.7	0.8731	$2,g$								1	14	<25
9751.7	0.8669	$0,g^+$	0	2	0	10	0	2	0	2	12	47
9752.2	0.8450	$1,u$	0	0	3	3	1	2	0	3	5	35
9752.5	0.8720	$2,u$	1	0	0	7	−5	7	7	1	14	29
9752.5	0.8408	$2,g$	2	0	1	1	1	3	1	3	4	41
		$2,g$	2	0	1	1	−1	3	3	3	4	56
9753.3	0.8280	$0,g^+$	3	1	0	0	0	0	0	4	0	98
9753.6	0.8670	$0,u^-$								2	12	<25
9754.2	0.8720	$2,g$								1	14	<25
9754.8	0.8425	$2,g$	0	3	1	1	1	3	1	4	4	54
		$2,g$	0	3	1	1	−1	3	3	4	4	44
9755.5	0.8509	$1,g$	1	2	0	3	−1	4	2	3	7	41
9755.6	0.8670	$2,u$	0	2	0	9	3	3	−1	2	12	26
9755.7	0.8425	$0,g^-$	0	3	1	1	−1	3	1	4	4	94
9755.8	0.8670	$2,g$	0	2	0	10	2	2	0	2	12	36
9756.6	0.8670	$0,u^+$	0	2	0	9	1	3	−1	2	12	35
9757.3	0.8720	$2,g$								1	14	<25
9757.4	0.8450	$1,g$	0	0	3	2	−2	3	3	3	5	45
9758.8	0.8731	$0,u^+$								1	14	<25
9760.9	0.8670	$2,g$	0	2	0	10	0	2	2	2	12	26
9761.1	0.8727	$0,u^-$	0	0	1	12	−2	2	2	1	14	87
9761.2	0.8670	$2,u$	0	2	0	9	1	3	1	2	12	36
9762.3	0.8425	$2,g$	0	3	1	1	1	3	1	4	4	42
		$2,g$	0	3	1	1	−1	3	3	4	4	55
9762.7	0.8450	$1,g$	0	0	3	2	2	3	−1	3	5	40
		$1,g$	0	0	3	2	−2	3	3	3	5	47
9763.4	0.8636	$1,g$	0	1	1	6	6	5	−5	2	11	64
9763.8	0.8729	$2,u$	0	0	1	12	2	2	0	1	14	30
9764.4	0.8671	$0,g^-$								2	12	<25
9764.5	0.8509	$1,g$								3	7	<25
9764.7	0.8670	$2,u$	0	2	0	9	−1	3	3	2	12	36
9765.1	0.8720	$2,u$	1	0	0	5	−5	9	7	1	14	36
9765.8	0.8670	$0,g^+$								2	12	<25
9767.9	0.8853	$0,g^+$	0	0	0	18	0	0	0	0	18	97
9769.4	0.8729	$2,u$	0	0	1	12	0	2	2	1	14	46
9769.7	0.8636	$1,u$								2	11	<25
9769.8	0.8853	$2,g$	0	0	0	18	2	0	0	0	18	97
9770.0	0.8671	$0,u^+$	0	2	0	5	3	7	−3	2	12	31
		$0,u^+$	0	2	0	5	1	7	−1	2	12	48
9772.3	0.8670	$2,g$								2	12	<25
9772.8	0.8450	$1,g$	0	0	3	2	0	3	1	3	5	34
9772.9	0.8760	$1,g$	0	1	0	15	1	0	0	1	15	98
9773.0	0.8671	$2,g$								2	12	<25
9773.5	0.8719	$0,u^+$	1	0	0	9	5	5	−5	1	14	62
9773.6	0.8720	$0,g^+$	1	0	0	8	4	6	−4	1	14	32
9774.8	0.8905	$0,u^-$								0	20	<25
9774.8	0.8905	$0,g^+$								0	20	<25
9775.1	0.8671	$2,u$								2	12	<25
9778.9	0.8729	$0,g^-$	0	0	1	11	−1	3	1	1	14	37
9780.0	0.8409	$0,u^+$	2	0	1	0	0	4	0	3	4	95
9780.3	0.8718	$2,g$	1	0	0	10	6	4	−4	1	14	66
9780.6	0.8668	$0,u^+$	0	2	0	11	1	1	−1	2	12	78
9781.6	0.8636	$1,g$								2	11	<25
9782.3	0.8668	$2,u$	0	2	0	11	3	1	−1	2	12	47
9782.7	0.8720	$0,u^-$								1	14	<25
9782.9	0.8720	$2,g$								1	14	<25
9783.0	0.8905	$2,u$								0	20	<25
9783.0	0.8905	$2,g$								0	20	<25
9783.2	0.8882	$1,g$								0	19	<25
9783.9	0.8882	$1,u$								0	19	<25
9784.1	0.8727	$2,g$	0	0	1	13	3	1	−1	1	14	55
9784.2	0.8451	$1,u$	0	0	3	1	1	4	0	3	5	38

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		1,u	0	0	3	1	−1	4	2	3	5	49
9784.3	0.8720	2,u								1	14	<25
9784.4	0.8510	1,u	1	2	0	2	0	5	1	3	7	26
		1,u	1	2	0	2	−2	5	3	3	7	45
9784.6	0.8754	1,u								1	15	<25
9784.6	0.8754	1,g								1	15	<25
9785.2	0.8346	0,g^+	2	2	0	2	0	0	0	4	2	98
9785.3	0.8726	0,g^+	0	0	1	13	1	1	−1	1	14	96
9787.0	0.8720	0,g^+								1	14	<25
9787.1	0.8728	2,g	0	0	1	13	1	1	1	1	14	28
9787.2	0.8636	1,u	0	1	1	5	−5	6	6	2	11	50
9787.3	0.8669	0,g^-	0	2	0	8	−2	4	2	2	12	26
		0,g^-	0	2	0	10	−2	2	2	2	12	41
9787.5	0.8346	2,g	2	2	0	2	2	0	0	4	2	99
9787.6	0.8510	1,u	1	2	0	2	2	5	−1	3	7	49
		1,u	1	2	0	2	−2	5	3	3	7	35
9787.7	0.8409	2,u	2	0	1	0	0	4	2	3	4	96
9787.7	0.8719	0,u^-	1	0	0	7	−5	7	5	1	14	27
		0,u^-	1	0	0	9	−5	5	5	1	14	45
9788.2	0.8365	0,g^+	0	5	0	0	0	2	0	5	2	99
9788.4	0.8426	0,u^+	0	3	1	0	0	4	0	4	4	96
9790.0	0.8881	1,u	0	0	0	12	−6	7	7	0	19	41
9791.4	0.8720	2,g								1	14	<25
9792.1	0.8882	1,g								0	19	<25
9792.4	0.8672	0,u^-	0	2	0	3	−3	9	3	2	12	44
		0,u^-	0	2	0	5	−3	7	3	2	12	26
9792.8	0.8558	1,g								2	9	<25
9792.8	0.8558	1,u								2	9	<25
9793.1	0.8720	2,u								1	14	<25
9793.1	0.8670	2,g								2	12	<25
9793.2	0.8672	0,g^+	0	2	0	4	2	8	−2	2	12	45
9793.4	0.8288	0,u^+	1	0	3	0	0	0	0	4	0	97
9794.6	0.8788	0,g^+								1	16	<25
9795.2	0.8720	0,u^+	1	0	0	5	5	9	−5	1	14	33
		0,u^+	1	0	0	7	5	7	−5	1	14	35
9795.3	0.8451	1,u	0	0	3	1	1	4	0	3	5	39
		1,u	0	0	3	1	−1	4	2	3	5	35
9795.3	0.8788	0,u^-								1	16	<25
9795.8	0.8882	1,u								0	19	<25
9796.0	0.8472	0,u^+	1	1	1	6	0	0	0	3	6	75
9796.1	0.8426	2,u	0	3	1	0	0	4	2	4	4	97
9796.4	0.8365	2,g	0	5	0	0	0	2	2	5	2	100
9796.5	0.8509	1,u	1	2	0	2	0	5	1	3	7	39
9797.6	0.8473	0,g^+	1	1	1	5	1	1	−1	3	6	88
9798.5	0.8472	2,u	1	1	1	6	2	0	0	3	6	77
9798.7	0.8473	2,g	1	1	1	5	3	1	−1	3	6	73
9799.1	0.8672	2,u	0	2	0	3	−3	9	5	2	12	27
9799.7	0.8672	2,g								2	12	<25
9800.7	0.8881	1,g	0	0	0	13	7	6	−6	0	19	40
9800.8	0.8636	1,u								2	11	<25
9800.9	0.8719	0,g^-	1	0	0	10	−4	4	4	1	14	33
9801.1	0.8636	1,g								2	11	<25
9801.4	0.8671	0,u^+								2	12	<25
9801.4	0.8669	0,g^+	0	2	0	10	0	2	0	2	12	27
9801.6	0.8669	0,u^-	0	2	0	11	−1	1	1	2	12	43
9802.1	0.8557	1,g	2	0	0	5	5	4	−4	2	9	26
		1,g	2	0	0	7	3	2	−2	2	9	26
9802.2	0.8788	2,u								1	16	<25
9802.6	0.8389	1,g	0	2	2	3	1	0	0	4	3	97
9802.6	0.8727	0,u^+	0	0	1	12	2	2	−2	1	14	27
		0,u^+	0	0	1	12	0	2	0	1	14	43
9802.8	0.8557	1,u	2	0	0	6	4	3	−3	2	9	37
9803.2	0.8788	2,g								1	16	<25
9804.7	0.8636	1,g								2	11	<25

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9805.0	0.8636	1,u	0	1	1	7	5	4	−4	2	11	31
9805.2	0.8720	0,u^-	1	0	0	7	−3	7	3	1	14	36
9805.5	0.8719	2,u								1	14	<25
9805.6	0.8720	0,g^-	1	0	0	6	−4	8	4	1	14	36
9806.5	0.8670	2,u	0	2	0	11	1	1	1	2	12	33
9806.9	0.8669	2,g								2	12	<25
9808.6	0.8727	2,u	0	0	1	12	2	2	0	1	14	33
		2,u	0	0	1	12	0	2	2	1	14	30
9808.6	0.8557	1,u	2	0	0	6	4	3	−3	2	9	28
		1,u	2	0	0	6	2	3	−1	2	9	29
9809.1	0.8671	2,u								2	12	<25
9809.1	0.8473	2,u	1	1	1	4	4	2	−2	3	6	90
9810.2	0.8473	0,g^-	1	1	1	5	−1	1	1	3	6	72
9810.4	0.8557	1,g	2	0	0	7	−1	2	2	2	9	29
9810.9	0.8720	2,g								1	14	<25
9811.3	0.8557	1,g	2	0	0	5	5	4	−4	2	9	56
9812.0	0.8636	1,u	0	1	1	5	5	6	−4	2	11	33
9812.2	0.8473	0,u^+	1	1	1	4	2	2	−2	3	6	68
9812.4	0.8884	1,u								0	19	<25
9812.8	0.8884	1,g	0	0	0	5	−5	14	6	0	19	26
9812.9	0.8718	0,g^+	1	0	0	10	4	4	−4	1	14	66
9813.1	0.8720	2,u								1	14	<25
9813.1	0.8720	0,u^+	1	0	0	9	3	5	−3	1	14	50
9813.5	0.8720	2,g								1	14	<25
9813.5	0.8452	1,g	0	0	3	0	0	5	1	3	5	82
9814.5	0.8473	2,g	1	1	1	5	1	1	1	3	6	62
9816.2	0.8673	0,u^+	0	2	0	3	1	9	−1	2	12	48
9817.1	0.8635	1,g	0	1	1	8	4	3	−3	2	11	32
9817.4	0.8788	0,g^+								1	16	<25
9817.6	0.8473	0,u^-	1	1	1	4	−2	2	2	3	6	89
9819.8	0.8788	0,u^-								1	16	<25
9820.3	0.8557	1,u	2	0	0	6	−2	3	3	2	9	45
9820.8	0.8636	1,u	0	1	1	7	−3	4	4	2	11	29
9821.2	0.8719	2,u	1	0	0	9	−3	5	5	1	14	27
9821.9	0.8390	1,u	0	2	2	2	2	1	−1	4	3	70
		1,u	0	2	2	2	0	1	1	4	3	29
9822.3	0.8720	2,g	1	0	0	10	4	4	−2	1	14	26
9823.0	0.8788	2,u								1	16	<25
9823.3	0.8673	2,u								2	12	<25
9823.6	0.8719	0,g^-	1	0	0	10	−4	4	4	1	14	30
9823.8	0.8473	2,u	1	1	1	4	2	2	0	3	6	34
		2,u	1	1	1	4	0	2	2	3	6	42
9824.1	0.8510	1,g	1	2	0	1	1	6	0	3	7	42
		1,g	1	2	0	1	−1	6	2	3	7	49
9824.1	0.8667	0,g^+	0	2	0	12	0	0	0	2	12	79
9824.7	0.8635	1,g								2	11	<25
9824.7	0.8719	2,u	1	0	0	11	5	3	−3	1	14	38
9825.0	0.8347	0,u^+	2	2	0	1	1	1	−1	4	2	99
9826.1	0.8720	0,u^-	1	0	0	9	−3	5	3	1	14	31
9826.2	0.8883	1,u								0	19	<25
9826.4	0.8720	0,g^+								1	14	<25
9826.5	0.8788	2,g								1	16	<25
9826.7	0.8672	0,g^-	0	2	0	2	−2	10	2	2	12	38
		0,g^-	0	2	0	4	−2	8	2	2	12	34
9826.9	0.8719	0,g^-	1	0	0	10	−2	4	2	1	14	37
9827.0	0.8667	2,g	0	2	0	12	2	0	0	2	12	76
9827.2	0.8726	0,g^-	0	0	1	13	−1	1	1	1	14	89
9828.9	0.8556	1,u	2	0	0	8	2	1	−1	2	9	38
9829.0	0.8473	0,u^+	1	1	1	4	0	2	0	3	6	40
9830.0	0.8669	0,u^-	0	2	0	11	−1	1	1	2	12	46
9830.4	0.8510	1,g	1	2	0	1	1	6	0	3	7	40
		1,g	1	2	0	1	−1	6	2	3	7	35
9831.1	0.8882	1,g	0	0	0	13	7	6	−6	0	19	31
9831.2	0.8635	1,u	0	1	1	7	−1	4	2	2	11	35

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9831.4	0.8726	2,*g*	0	0	1	13	1	1	1	1	14	63
9831.5	0.8635	1,*g*								2	11	<25
9831.5	0.8882	1,*u*								0	19	<25
9832.1	0.8390	1,*u*	0	2	2	2	2	1	−1	4	3	29
		1,*u*	0	2	2	2	0	1	1	4	3	68
9832.2	0.8347	0,u^-	2	2	0	1	−1	1	1	4	2	99
9832.8	0.8672	2,*g*	0	2	0	2	−2	10	4	2	12	31
9832.9	0.8474	0,g^+	1	1	1	3	3	3	−3	3	6	75
9833.5	0.8558	1,*g*	2	0	0	5	−3	4	4	2	9	65
9833.6	0.8719	2,*g*								1	14	<25
9833.7	0.8635	1,*g*								2	11	<25
9833.8	0.8473	2,*u*	1	1	1	4	2	2	0	3	6	25
		2,*u*	1	1	1	4	0	2	2	3	6	40
9834.2	0.8635	1,*u*								2	11	<25
9834.6	0.8719	2,*u*								1	14	<25
9834.6	0.8474	0,g^-	1	1	1	3	−3	3	3	3	6	95
9834.8	0.8555	1,*g*	2	0	0	9	1	0	0	2	9	67
9835.2	0.8669	2,*u*	0	2	0	11	1	1	1	2	12	29
9835.3	0.8347	2,*u*	2	2	0	1	1	1	1	4	2	99
9836.1	0.8883	1,*g*								0	19	<25
9836.9	0.8673	0,g^+	0	2	0	2	2	10	−2	2	12	46
		0,g^+	0	2	0	2	0	10	0	2	12	30
9837.3	0.8602	0,u^-	0	0	2	3	−1	7	1	2	10	36
		0,u^-	0	0	2	5	−1	5	1	2	10	25
9837.3	0.8602	0,g^+								2	10	<25
9839.4	0.8720	2,*u*								1	14	<25
9839.4	0.8718	0,u^+	1	0	0	9	1	5	−1	1	14	51
9840.1	0.8720	0,u^-	1	0	0	7	−3	7	3	1	14	27
9840.2	0.8557	1,*g*	2	0	0	5	3	4	−2	2	9	31
9840.9	0.8720	2,*g*								1	14	<25
9841.8	0.8787	0,g^-	0	1	0	8	−8	8	8	1	16	66
9842.0	0.8557	1,*u*	2	0	0	8	0	1	1	2	9	44
9842.1	0.8474	2,*g*	1	1	1	3	3	3	−1	3	6	65
9843.3	0.8474	0,g^+	1	1	1	3	1	3	−1	3	6	59
9843.7	0.8670	0,g^+								2	12	<25
9844.2	0.8882	1,*g*								0	19	<25
9844.4	0.8673	2,*g*	0	2	0	2	2	10	0	2	12	35
		2,*g*	0	2	0	2	0	10	2	2	12	29
9844.6	0.8602	2,*g*								2	10	<25
9844.6	0.8602	2,*u*								2	10	<25
9845.5	0.8558	1,*u*	2	0	0	4	−4	5	5	2	9	86
9845.6	0.8883	1,*u*								0	19	<25
9847.5	0.8787	2,*u*	0	1	0	9	9	7	−7	1	16	44
9848.6	0.8557	1,*g*	2	0	0	7	−1	2	2	2	9	30
9848.9	0.8636	1,*g*								2	11	<25
9849.8	0.8725	0,u^+	0	0	1	14	0	0	0	1	14	97
9849.9	0.8474	2,*g*	1	1	1	3	−1	3	3	3	6	67
9850.1	0.8671	2,*g*	0	2	0	0	0	12	2	2	12	25
9851.3	0.8635	1,*u*								2	11	<25
9851.6	0.8718	0,u^+	1	0	0	11	3	3	−3	1	14	36
9851.8	0.8725	2,*u*	0	0	1	14	2	0	0	1	14	97
9852.1	0.8558	1,*u*	2	0	0	4	4	5	−3	2	9	68
9852.9	0.8718	0,g^+	1	0	0	10	2	4	−2	1	14	39
9853.8	0.8474	0,g^-	1	1	1	3	−1	3	1	3	6	52
		0,g^-	1	1	1	5	−1	1	1	3	6	26
9854.5	0.8718	2,*g*	1	0	0	10	−2	4	4	1	14	34
9854.5	0.8635	1,*u*								2	11	<25
9854.5	0.8904	0,g^+								0	20	<25
9855.0	0.8390	1,*g*	0	2	2	1	1	2	0	4	3	52
		1,*g*	0	2	2	1	−1	2	2	4	3	46
9855.0	0.8905	0,u^-								0	20	<25
9855.7	0.8721	0,g^-	1	0	0	4	−4	10	4	1	14	32
9856.2	0.8635	1,*g*								2	11	<25
9857.2	0.8719	0,g^+	1	0	0	8	2	6	−2	1	14	30

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,g^+$	1	0	0	8	0	6	0	1	14	30
9857.4	0.8720	$2,u$								1	14	<25
9857.8	0.8788	$0,u^+$	0	1	0	7	7	9	−7	1	16	35
9858.3	0.8575	$1,g$								3	9	<25
9858.3	0.8575	$1,u$								3	9	<25
9858.4	0.8882	$1,g$	0	0	0	9	5	10	−4	0	19	32
9858.5	0.8674	$0,u^+$	0	2	0	1	1	11	−1	2	12	70
9859.0	0.8474	$2,g$	1	1	1	3	1	3	1	3	6	38
9859.3	0.8557	$1,g$	2	0	0	7	1	2	0	2	9	28
9860.0	0.8718	$0,u^-$	1	0	0	11	−3	3	3	1	14	68
9862.2	0.8720	$2,g$								1	14	<25
9862.6	0.8904	$2,u$								0	20	<25
9862.8	0.8672	$0,u^-$	0	2	0	3	−1	9	1	2	12	26
9862.9	0.8511	$1,u$	1	2	0	0	0	7	1	3	7	86
9863.0	0.8390	$1,g$	0	2	2	1	1	2	0	4	3	45
		$1,g$	0	2	2	1	−1	2	2	4	3	53
9863.1	0.8904	$2,g$								0	20	<25
9863.3	0.8720	$0,u^-$	1	0	0	11	−1	3	1	1	14	36
9863.4	0.8719	$0,u^+$	1	0	0	7	1	7	−1	1	14	42
9863.4	0.8720	$0,g^+$	1	0	0	10	0	4	0	1	14	42
9864.1	0.8719	$2,u$	1	0	0	11	3	3	−1	1	14	32
9864.6	0.8674	$2,u$	0	2	0	1	−1	11	3	2	12	42
9864.9	0.8635	$1,u$								2	11	<25
9865.5	0.8788	$2,g$								1	16	<25
9865.6	0.8635	$1,g$	0	1	1	10	2	1	−1	2	11	31
9867.0	0.8720	$2,g$								1	14	<25
9867.5	0.8475	$0,u^+$	1	1	1	2	2	4	−2	3	6	63
		$0,u^+$	1	1	1	2	0	4	0	3	6	30
9867.7	0.8635	$1,u$	0	1	1	9	−1	2	2	2	11	30
9867.9	0.8635	$1,g$								2	11	<25
9867.9	0.8601	$0,u^+$	0	0	2	3	3	7	−3	2	10	26
		$0,u^+$	0	0	2	5	3	5	−3	2	10	30
9868.1	0.8601	$0,g^-$	0	0	2	4	−4	6	4	2	10	28
		$0,g^-$	0	0	2	4	−2	6	2	2	10	27
9868.4	0.8882	$1,u$								0	19	<25
9868.8	0.8575	$1,g$	0	3	0	5	5	4	−4	3	9	33
9869.3	0.8720	$2,u$	1	0	0	7	1	7	1	1	14	31
9869.4	0.8558	$1,u$	2	0	0	4	−2	5	3	2	9	42
9869.4	0.8575	$1,u$	0	3	0	6	4	3	−3	3	9	41
9870.5	0.8672	$2,u$								2	12	<25
9870.7	0.8329	$1,u$	0	4	1	1	1	0	0	5	1	100
9870.8	0.8719	$2,g$								1	14	<25
9870.9	0.8881	$1,u$	0	0	0	10	−4	9	5	0	19	29
		$1,u$	0	0	0	12	−4	7	5	0	19	27
9871.0	0.8719	$0,u^+$	1	0	0	11	1	3	−1	1	14	34
9871.2	0.8880	$1,g$								0	19	<25
9871.6	0.8787	$0,g^+$	0	1	0	8	8	8	−8	1	16	66
9871.7	0.8719	$0,g^-$	1	0	0	10	−2	4	2	1	14	33
9871.9	0.8558	$1,u$	2	0	0	4	2	5	−1	2	9	29
9872.2	0.8601	$2,g$	0	0	2	6	6	4	−4	2	10	42
9872.5	0.8475	$0,u^-$	1	1	1	2	−2	4	2	3	6	89
9873.6	0.8601	$2,u$	0	0	2	5	5	5	−3	2	10	32
9874.3	0.8637	$1,g$								2	11	<25
9874.9	0.8475	$2,u$	1	1	1	2	0	4	2	3	6	27
		$2,u$	1	1	1	2	−2	4	4	3	6	48
9875.2	0.8718	$2,g$	1	0	0	12	4	2	−2	1	14	34
9876.1	0.8718	$2,u$	1	0	0	11	1	3	1	1	14	36
9876.2	0.8574	$1,u$	0	3	0	6	2	3	−1	3	9	31
9876.9	0.8575	$1,g$	0	3	0	5	5	4	−4	3	9	41
9877.1	0.8674	$0,g^+$	0	2	0	0	0	12	0	2	12	46
9877.6	0.8348	$0,g^+$	2	2	0	0	0	2	0	4	2	98
9878.5	0.8574	$1,g$								3	9	<25
9878.6	0.8753	$1,g$								1	15	<25
9878.6	0.8753	$1,u$								1	15	<25

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9878.7	0.8720	$0,g^+$	1	0	0	6	2	8	−2	1	14	47
		$0,g^+$	1	0	0	6	0	8	0	1	14	40
9879.1	0.8882	$1,u$	0	0	0	10	4	9	−3	0	19	31
9879.1	0.8475	$2,u$	1	1	1	2	2	4	0	3	6	43
		$2,u$	1	1	1	2	−2	4	4	3	6	43
9879.3	0.8787	$2,u$								1	16	<25
9880.3	0.8881	$1,g$								0	19	<25
9880.3	0.8719	$2,u$	1	0	0	11	−1	3	3	1	14	32
9880.5	0.8412	$0,g^+$	1	3	0	4	0	0	0	4	4	96
9880.6	0.8637	$1,u$	0	1	1	3	−3	8	4	2	11	25
9882.3	0.8474	$0,u^+$	1	1	1	2	0	4	0	3	6	40
9882.4	0.8557	$1,u$	2	0	0	6	0	3	1	2	9	26
9882.5	0.8716	$0,g^+$	1	0	0	12	2	2	−2	1	14	52
		$0,g^+$	1	0	0	12	0	2	0	1	14	37
9882.8	0.8412	$2,g$	1	3	0	4	2	0	0	4	4	97
9883.2	0.8601	$2,g$	0	0	2	6	6	4	−4	2	10	51
9883.7	0.8634	$1,g$	0	1	1	10	2	1	−1	2	11	32
9883.9	0.8788	$0,g^-$								1	16	<25
9884.0	0.8722	$0,u^-$	1	0	0	3	−3	11	3	1	14	35
		$0,u^-$	1	0	0	5	−3	9	3	1	14	27
9884.0	0.8601	$0,u^-$	0	0	2	5	−5	5	5	2	10	69
9884.1	0.8674	$2,g$	0	2	0	0	0	12	2	2	12	46
9885.1	0.8718	$2,g$								1	14	<25
9885.8	0.8348	$2,g$	2	2	0	0	0	2	2	4	2	98
9886.9	0.8720	$2,g$	1	0	0	6	0	8	2	1	14	37
9887.0	0.8575	$1,u$	0	3	0	6	−2	3	3	3	9	40
9887.2	0.8601	$0,g^+$	0	0	2	4	4	6	−4	2	10	43
		$0,g^+$	0	0	2	6	4	4	−4	2	10	38
9888.2	0.8474	$2,u$	1	1	1	2	0	4	2	3	6	43
9888.9	0.8559	$1,g$	2	0	0	3	−3	6	4	2	9	73
9889.6	0.8637	$1,u$								2	11	<25
9890.7	0.8787	$0,u^+$	0	1	0	7	7	9	−7	1	16	26
9891.7	0.8721	$2,u$								1	14	<25
9892.0	0.8882	$1,g$								0	19	<25
9892.3	0.8601	$2,u$	0	0	2	5	5	5	−3	2	10	25
9892.6	0.8601	$0,u^+$	0	0	2	5	5	5	−5	2	10	79
9892.9	0.8559	$1,g$	2	0	0	3	3	6	−2	2	9	64
9893.0	0.8720	$0,u^+$	1	0	0	5	1	9	−1	1	14	48
9893.6	0.8391	$1,u$	0	2	2	0	0	3	1	4	3	97
9894.8	0.8787	$2,u$	0	1	0	7	−7	9	9	1	16	25
9894.9	0.8880	$1,u$								0	19	<25
9896.4	0.8787	$2,g$								1	16	<25
9897.3	0.8574	$1,u$	0	3	0	8	2	1	−1	3	9	42
9898.8	0.8636	$1,u$								2	11	<25
9899.3	0.8575	$1,g$	0	3	0	5	−3	4	4	3	9	62
9901.1	0.8719	$0,u^+$								1	14	<25
9901.2	0.8720	$2,u$								1	14	<25
9901.6	0.8601	$2,g$								2	10	<25
9902.1	0.8884	$1,g$								0	19	<25
9903.0	0.8601	$0,g^-$	0	0	2	6	−4	4	4	2	10	38
9903.2	0.8559	$1,g$	2	0	0	3	1	6	0	2	9	27
		$1,g$	2	0	0	3	−1	6	2	2	9	35
9903.2	0.8413	$0,u^+$	1	3	0	3	1	1	−1	4	4	97
9904.1	0.8475	$0,g^+$	1	1	1	1	1	5	−1	3	6	91
9904.3	0.8601	$0,u^-$	0	0	2	5	−5	5	5	2	10	28
		$0,u^-$	0	0	2	5	−3	5	3	2	10	41
9904.4	0.8574	$1,g$	0	3	0	9	1	0	0	3	9	49
9904.5	0.8413	$2,u$	1	3	0	3	3	1	−1	4	4	83
9904.9	0.8717	$0,g^-$	1	0	0	12	−2	2	2	1	14	70
9906.0	0.8904	$0,g^-$								0	20	<25
9906.8	0.8575	$1,g$								3	9	<25
9907.1	0.8787	$0,u^-$	0	1	0	9	−7	7	7	1	16	50
9907.5	0.8884	$1,u$								0	19	<25
9907.7	0.8720	$2,u$								1	14	<25

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9907.8	0.8634	1,u	0	1	1	11	1	0	0	2	11	42
9908.0	0.8635	1,g	0	1	1	10	0	1	1	2	11	35
9908.4	0.8905	0,u^+								0	20	<25
9909.1	0.8558	1,g								2	9	<25
9909.6	0.8626	1,u								2	11	<25
9909.7	0.8626	1,g								2	11	<25
9909.8	0.8574	1,u	0	3	0	8	0	1	1	3	9	40
9910.0	0.8722	0,g^+	1	0	0	4	2	10	−2	1	14	46
9910.1	0.8576	1,u	0	3	0	4	−4	5	5	3	9	81
9910.5	0.8718	2,g	1	0	0	12	2	2	0	1	14	25
		2,g	1	0	0	12	0	2	2	1	14	26
9910.8	0.8437	1,g	1	0	2	5	1	0	0	3	5	83
9910.8	0.8880	1,g	0	0	0	11	−3	8	4	0	19	26
9911.4	0.8475	2,g	1	1	1	1	1	5	1	3	6	41
		2,g	1	1	1	1	−1	5	3	3	6	52
9911.9	0.8601	2,u	0	0	2	5	−3	5	5	2	10	25
9912.7	0.8638	1,g	0	1	1	2	−2	9	3	2	11	36
9912.9	0.8475	0,g^-	1	1	1	1	−1	5	1	3	6	78
9914.3	0.8787	2,g	0	1	0	10	8	6	−6	1	16	41
9914.5	0.8904	2,u								0	20	<25
9914.9	0.8575	1,g	0	3	0	7	−1	2	2	3	9	36
9915.0	0.8438	1,u	1	0	2	4	2	1	−1	3	5	62
		1,u	1	0	2	4	0	1	1	3	5	30
9915.1	0.8883	1,u								0	19	<25
9915.6	0.8413	0,u^-	1	3	0	3	−1	1	1	4	4	96
9915.7	0.8720	0,u^-	1	0	0	11	−1	3	1	1	14	35
9915.8	0.8312	1,u	2	1	1	1	1	0	0	4	1	98
9916.0	0.8927	1,g								0	21	<25
9916.0	0.8927	1,u								0	21	<25
9916.0	0.8720	0,g^+								1	14	<25
9916.1	0.8637	1,g	0	1	1	2	2	9	−1	2	11	34
9916.2	0.8330	1,g	0	4	1	0	0	1	1	5	1	100
9916.3	0.8721	2,g	1	0	0	4	−2	10	4	1	14	28
9916.6	0.8720	0,g^-								1	14	<25
9916.8	0.8905	2,g								0	20	<25
9917.2	0.8576	1,u	0	3	0	4	4	5	−3	3	9	65
9918.5	0.8601	0,g^+	0	0	2	6	2	4	−2	2	10	48
9918.8	0.8601	0,u^-	0	0	2	1	−1	9	1	2	10	26
		0,u^-	0	0	2	7	−1	3	1	2	10	28
9918.9	0.8601	2,g	0	0	2	4	−4	6	6	2	10	50
9919.0	0.8413	2,u	1	3	0	3	1	1	1	4	4	80
9919.2	0.8601	0,g^+	0	0	2	6	0	4	0	2	10	38
9919.4	0.8475	2,g	1	1	1	1	1	5	1	3	6	43
		2,g	1	1	1	1	−1	5	3	3	6	38
9919.4	0.8600	0,u^+	0	0	2	5	1	5	−1	2	10	28
9919.5	0.8880	1,g								0	19	<25
9919.7	0.8881	1,u	0	0	0	14	6	5	−5	0	19	29
9921.3	0.8600	2,u	0	0	2	5	5	5	−3	2	10	27
		2,u	0	0	2	7	5	3	−3	2	10	53
9922.4	0.8719	2,u								1	14	<25
9922.9	0.8395	0,g^+	3	0	0	4	0	0	0	3	4	97
9923.4	0.8720	2,g	1	0	0	12	0	2	2	1	14	26
9923.7	0.8715	0,u^+	1	0	0	13	1	1	−1	1	14	91
9923.9	0.8787	0,g^+								1	16	<25
9924.1	0.8788	0,g^-	0	1	0	6	−6	10	6	1	16	45
9924.5	0.8601	2,g								2	10	<25
9924.5	0.8633	1,u	0	1	1	11	1	0	0	2	11	54
9924.8	0.8716	2,u	1	0	0	13	3	1	−1	1	14	47
		2,u	1	0	0	13	1	1	1	1	14	28
9924.8	0.8721	2,g								1	14	<25
9925.1	0.8723	0,u^+	1	0	0	3	1	11	−1	1	14	48
9925.2	0.8395	2,g	3	0	0	4	2	0	0	3	4	97
9925.7	0.8601	2,u								2	10	<25
9927.0	0.8574	1,g	0	3	0	9	1	0	0	3	9	34

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9928.0	0.8438	1,u	1	0	2	4	2	1	−1	3	5	26
		1,u	1	0	2	4	0	1	1	3	5	55
9928.2	0.8885	1,g								0	19	<25
9928.6	0.8601	0,g^-	0	0	2	4	−4	6	4	2	10	28
		0,g^-	0	0	2	6	−4	4	4	2	10	31
9930.0	0.8787	0,u^-	0	1	0	7	−7	9	7	1	16	58
9930.1	0.8559	1,u	2	0	0	2	−2	7	3	2	9	65
9930.4	0.8788	2,u								1	16	<25
9930.4	0.8601	0,u^+	0	0	2	3	3	7	−3	2	10	31
		0,u^+	0	0	2	7	3	3	−3	2	10	34
9930.6	0.8601	0,g^+	0	0	2	4	4	6	−4	2	10	39
		0,g^+	0	0	2	6	4	4	−4	2	10	29
9930.7	0.8787	0,u^+	0	1	0	9	7	7	−7	1	16	68
9930.8	0.8439	1,g	1	0	2	3	3	2	−2	3	5	75
9930.9	0.8787	2,g	0	1	0	10	8	6	−6	1	16	27
9931.5	0.8881	1,g	0	0	0	9	3	10	−2	0	19	27
9932.1	0.8882	1,u								0	19	<25
9932.1	0.8600	2,g	0	0	2	8	4	2	−2	2	10	32
9932.6	0.8560	1,u	2	0	0	2	2	7	−1	2	9	59
9932.8	0.8723	2,u	1	0	0	3	1	11	1	1	14	31
9933.4	0.8881	1,u								0	19	<25
9933.4	0.8788	2,u	0	1	0	7	7	9	−5	1	16	30
9934.0	0.8753	1,g								1	15	<25
9934.2	0.8576	1,u	0	3	0	4	−2	5	3	3	9	38
9934.3	0.8636	1,g	0	1	1	0	0	11	1	2	11	28
9934.4	0.8753	1,u								1	15	<25
9934.9	0.8601	2,u								2	10	<25
9935.0	0.8354	0,u^+	0	1	3	2	0	0	0	4	2	97
9935.7	0.8601	0,u^-	0	0	2	3	−3	7	3	2	10	28
		0,u^-	0	0	2	7	−3	3	3	2	10	52
9936.2	0.8724	0,g^+	1	0	0	2	2	12	−2	1	14	49
9936.6	0.8638	1,u	0	1	1	1	1	10	0	2	11	31
		1,u	0	1	1	1	−1	10	2	2	11	32
9936.9	0.8576	1,u								3	9	<25
9936.9	0.8601	2,g								2	10	<25
9937.0	0.8414	0,g^+	1	3	0	2	2	2	−2	4	4	64
		0,g^+	1	3	0	2	0	2	0	4	4	34
9937.4	0.8601	0,g^-								2	10	<25
9937.6	0.8354	2,u	0	1	3	2	2	0	0	4	2	98
9938.5	0.8601	2,u								2	10	<25
9938.7	0.8439	1,g	1	0	2	3	−1	2	2	3	5	57
9939.5	0.8559	1,u	2	0	0	2	0	7	1	2	9	27
		1,u	2	0	0	4	0	5	1	2	9	27
9940.7	0.8601	0,u^+	0	0	2	7	1	3	−1	2	10	34
9941.2	0.8625	1,u	1	1	0	6	6	5	−5	2	11	29
9941.5	0.8476	0,u^+	1	1	1	0	0	6	0	3	6	87
9942.0	0.8883	1,u								0	19	<25
9942.4	0.8600	2,g								2	10	<25
9942.4	0.8625	1,g								2	11	<25
9942.4	0.8414	0,g^-	1	3	0	2	−2	2	2	4	4	99
9943.0	0.8788	2,g								1	16	<25
9943.9	0.8788	0,u^-								1	16	<25
9944.0	0.8723	2,g	1	0	0	2	2	12	0	1	14	35
9944.8	0.8600	0,g^+								2	10	<25
9945.9	0.8414	2,g	1	3	0	2	2	2	0	4	4	70
		2,g	1	3	0	2	0	2	2	4	4	28
9947.1	0.8395	0,u^+	3	0	0	3	1	1	−1	3	4	98
9947.8	0.8601	2,u	0	0	2	7	−1	3	3	2	10	26
9947.8	0.8883	1,g								0	19	<25
9948.3	0.8395	2,u	3	0	0	3	3	1	−1	3	4	83
9948.4	0.8720	0,u^-								1	14	<25
9948.6	0.8575	1,u								3	9	<25
9948.6	0.8719	0,g^+	1	0	0	12	0	2	0	1	14	26
9948.7	0.8476	2,u	1	1	1	0	0	6	2	3	6	88

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9948.9	0.8439	1,g	1	0	2	3	1	2	0	3	5	43
		1,g	1	0	2	3	−1	2	2	3	5	27
9949.9	0.8724	0,u^+	1	0	0	1	1	13	−1	1	14	63
		0,u^+	1	0	0	3	1	11	−1	1	14	26
9951.7	0.8414	0,g^+	1	3	0	2	2	2	−2	4	4	35
		0,g^+	1	3	0	2	0	2	0	4	4	60
9952.3	0.8576	1,g	0	3	0	3	−3	6	4	3	9	71
9952.3	0.8788	0,g^+								1	16	<25
9952.8	0.8636	1,u								2	11	<25
9952.9	0.8753	1,g								1	15	<25
9953.0	0.8883	1,u								0	19	<25
9953.3	0.8882	1,g								0	19	<25
9954.1	0.8753	1,u								1	15	<25
9954.5	0.8600	2,g								2	10	<25
9954.5	0.8721	2,u								1	14	<25
9954.7	0.8719	2,g								1	14	<25
9956.0	0.8788	2,g								1	16	<25
9956.2	0.8625	1,u	1	1	0	6	6	5	−5	2	11	55
9956.6	0.8576	1,g	0	3	0	3	3	6	−2	3	9	61
9956.9	0.8414	2,g	1	3	0	2	2	2	0	4	4	27
		2,g	1	3	0	2	0	2	2	4	4	69
9957.4	0.8788	2,u								1	16	<25
9957.5	0.8722	2,u	1	0	0	1	1	13	1	1	14	36
9957.7	0.8886	1,u	0	0	0	0	0	19	1	0	19	38
9957.7	0.8355	0,g^+	0	1	3	1	1	1	−1	4	2	98
9959.5	0.8395	0,u^-	3	0	0	3	−1	1	1	3	4	96
9959.8	0.8439	1,u	1	0	2	2	2	3	−1	3	5	30
		1,u	1	0	2	2	0	3	1	3	5	29
		1,u	1	0	2	2	−2	3	3	3	5	35
9959.9	0.8601	0,g^+								2	10	<25
9960.0	0.8638	1,g	0	1	1	0	0	11	1	2	11	31
9961.0	0.8904	0,g^-	0	0	0	10	−10	10	10	0	20	36
9961.4	0.8601	2,g	0	0	2	6	−2	4	4	2	10	25
9962.4	0.8721	0,g^+								1	14	<25
9962.6	0.8313	1,g	2	1	1	0	0	1	1	4	1	97
9963.0	0.8882	1,u								0	19	<25
9963.0	0.8395	2,u	3	0	0	3	1	1	1	3	4	81
9963.3	0.8625	1,g	1	1	0	7	5	4	−4	2	11	28
9963.9	0.8880	1,g								0	19	<25
9964.3	0.8903	2,u	0	0	0	11	11	9	−9	0	20	45
9964.7	0.8787	0,g^-	0	1	0	10	−6	6	6	1	16	32
9964.9	0.8355	0,g^-	0	1	3	1	−1	1	1	4	2	98
9965.0	0.8439	1,u	1	0	2	2	2	3	−1	3	5	40
		1,u	1	0	2	2	−2	3	3	3	5	54
9965.0	0.8600	0,u^+	0	0	2	9	1	1	−1	2	10	41
9966.6	0.8576	1,g	0	3	0	3	−1	6	2	3	9	32
9967.1	0.8601	0,u^-	0	0	2	3	−3	7	3	2	10	35
		0,u^-	0	0	2	5	−3	5	3	2	10	34
9967.2	0.8904	0,g^+	0	0	0	10	10	10	−10	0	20	38
9967.4	0.8560	1,g	2	0	0	1	1	8	0	2	9	30
		1,g	2	0	0	1	−1	8	2	2	9	54
9967.6	0.8601	2,u	0	0	2	3	−3	7	5	2	10	34
9968.0	0.8355	2,g	0	1	3	1	1	1	1	4	2	98
9968.0	0.8716	0,u^-	1	0	0	13	−1	1	1	1	14	72
9968.4	0.8599	2,u	0	0	2	9	3	1	−1	2	10	48
9969.4	0.8721	2,g								1	14	<25
9969.9	0.8601	0,u^+	0	0	2	3	1	7	−1	2	10	30
		0,u^+	0	0	2	9	1	1	−1	2	10	26
9969.9	0.8600	0,g^-	0	0	2	2	−2	8	2	2	10	27
		0,g^-	0	0	2	8	−2	2	2	2	10	58
9970.8	0.8787	0,u^-								1	16	<25
9970.9	0.8560	1,g	2	0	0	1	1	8	0	2	9	39
9971.6	0.8904	0,u^+	0	0	0	9	9	11	−9	0	20	33
9973.1	0.8716	2,u	1	0	0	13	1	1	1	1	14	45

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9973.2	0.8787	2,u								1	16	<25
9973.8	0.8576	1,g								3	9	<25
9974.1	0.8601	0,g^+								2	10	<25
9974.5	0.8439	1,u	1	0	2	2	0	3	1	3	5	46
9974.5	0.8600	2,g								2	10	<25
9974.7	0.8601	0,u^-	0	0	2	1	−1	9	1	2	10	30
		0,u^-	0	0	2	9	−1	1	1	2	10	28
9974.9	0.8625	1,u								2	11	<25
9975.2	0.8752	1,g	0	0	1	8	8	7	−7	1	15	48
9975.5	0.8743	1,u								1	15	<25
9975.5	0.8743	1,g								1	15	<25
9975.8	0.8905	0,u^-								0	20	<25
9976.4	0.8881	1,g								0	19	<25
9977.0	0.8879	1,u	0	0	0	14	−4	5	5	0	19	36
9977.4	0.8904	2,g								0	20	<25
9977.6	0.8787	2,g								1	16	<25
9979.4	0.8904	2,u								0	20	<25
9979.7	0.8601	2,u								2	10	<25
9980.1	0.8753	1,u	0	0	1	7	−7	8	8	1	15	41
9980.6	0.8601	2,u								2	10	<25
9980.7	0.8601	2,g	0	0	2	8	0	2	2	2	10	36
9980.9	0.8625	1,g	1	1	0	5	−5	6	6	2	11	41
9980.9	0.8714	0,g^+	1	0	0	14	0	0	0	1	14	94
9981.8	0.8414	0,u^+	1	3	0	1	1	3	−1	4	4	97
9982.4	0.8396	0,g^+	3	0	0	2	2	2	−2	3	4	64
		0,g^+	3	0	0	2	0	2	0	3	4	34
9983.3	0.8715	2,g	1	0	0	14	2	0	0	1	14	91
9984.2	0.8880	1,u								0	19	<25
9985.2	0.8905	2,g								0	20	<25
9985.3	0.8880	1,g								0	19	<25
9986.1	0.8600	0,u^+								2	10	<25
9987.2	0.8881	1,g								0	19	<25
9987.8	0.8396	0,g^-	3	0	0	2	−2	2	2	3	4	99
9989.1	0.8786	0,g^+	0	1	0	10	6	6	−6	1	16	49
9989.4	0.8904	0,g^+	0	0	0	10	10	10	−10	0	20	31
9989.5	0.8541	0,u^+	0	2	1	4	0	4	0	3	8	26
9989.7	0.8541	0,g^-	0	2	1	3	−1	5	1	3	8	31
		0,g^-	0	2	1	5	−1	3	1	3	8	39
9990.0	0.8414	2,u	1	3	0	1	1	3	1	4	4	57
		2,u	1	3	0	1	−1	3	3	4	4	41
9990.4	0.8601	2,u								2	10	<25
9990.5	0.8414	0,u^-	1	3	0	1	−1	3	1	4	4	95
9990.7	0.8540	2,u	0	2	1	4	4	4	−2	3	8	29
		2,u	0	2	1	6	4	2	−2	3	8	63
9991.0	0.8540	2,g	0	2	1	5	5	3	−3	3	8	55
9991.2	0.8603	0,g^+	0	0	2	2	2	8	−2	2	10	41
9991.3	0.8396	2,g	3	0	0	2	2	2	0	3	4	70
		2,g	3	0	0	2	0	2	2	3	4	28
9991.4	0.8788	0,u^+								1	16	<25
9992.2	0.8577	1,u	0	3	0	2	−2	7	3	3	9	66
9992.4	0.8786	0,g^-	0	1	0	8	−6	8	6	1	16	36
		0,g^-	0	1	0	10	−6	6	6	1	16	31
9993.1	0.8624	1,u	1	1	0	8	4	3	−3	2	11	36
9993.1	0.8440	1,g	1	0	2	1	1	4	0	3	5	44
		1,g	1	0	2	1	−1	4	2	3	5	49
9993.1	0.8356	0,u^+	0	1	3	0	0	2	0	4	2	96
9993.3	0.8540	2,g	0	2	1	5	5	3	−3	3	8	42
		2,g	0	2	1	5	3	3	−1	3	8	33
9993.5	0.8785	2,u	0	1	0	11	7	5	−5	1	16	63
9994.2	0.8540	0,g^+	0	2	1	5	1	3	−1	3	8	34
		0,g^+	0	2	1	7	1	1	−1	3	8	43
9994.6	0.8577	1,u	0	3	0	2	2	7	−1	3	9	59
9994.9	0.8540	2,u	0	2	1	4	2	4	0	3	8	27
		2,u	0	2	1	6	2	2	0	3	8	43

TABLE 13. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{12}C_2D_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 10 000 cm^{-1}, calculated from the results and model provided in Herman *et al.*[31] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9995.2	0.8625	1,g								2	11	<25
9996.1	0.8603	2,g	0	0	2	2	−2	8	4	2	10	31
9996.2	0.8625	1,g	1	1	0	5	−5	6	6	2	11	27
9996.3	0.8540	0,u^+	0	2	1	6	2	2	−2	3	8	45
		0,u^+	0	2	1	6	0	2	0	3	8	29
9996.8	0.8625	1,u								2	11	<25
9996.9	0.8888	1,g	0	0	0	1	1	18	0	0	19	40
		1,g	0	0	0	1	−1	18	2	0	19	37
9997.2	0.8396	0,g^+	3	0	0	2	2	2	−2	3	4	35
		0,g^+	3	0	0	2	0	2	0	3	4	60
9997.3	0.8904	2,u								0	20	<25
9997.3	0.8540	0,u^-	0	2	1	4	−2	4	2	3	8	36
		0,u^-	0	2	1	6	−2	2	2	3	8	50
9997.4	0.8414	2,u	1	3	0	1	1	3	1	4	4	39
		2,u	1	3	0	1	−1	3	3	4	4	59
9998.4	0.8881	1,u								0	19	<25
9998.5	0.8788	0,u^+								1	16	<25
9999.4	0.8540	2,g	0	2	1	5	1	3	1	3	8	34
		2,g	0	2	1	7	1	1	1	3	8	26
9999.6	0.8561	1,u	2	0	0	0	0	9	1	2	9	77

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] Fractions of basis states are mentioned provided they are larger than 25%. Only states with $k=0,1,2$ are printed. The full set of states in the same energy range is available on the WEB site of the Laboratoire de Chimie Physique Moléculaire at the Université libre de Bruxelles (http://www.ulb.ac.be/cpm/)

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
603.8	1.121	1,g	0	0	0	1	1	0	0	0	1	100
728.4	1.122	1,u	0	0	0	0	0	1	1	0	1	100
1 212.2	1.122	0,g^+	0	0	0	2	0	0	0	0	2	100
1 215.4	1.122	2,g	0	0	0	2	2	0	0	0	2	100
1 317.5	1.123	0,u^+	0	0	0	1	1	1	−1	0	2	100
1 329.4	1.123	0,u^-	0	0	0	1	−1	1	1	0	2	100
1 336.7	1.123	2,u	0	0	0	1	1	1	1	0	2	100
1 445.4	1.123	0,g^+	0	0	0	0	0	2	0	0	2	100
1 459.1	1.123	2,g	0	0	0	0	0	2	2	0	2	100
1 828.3	1.123	1,g	0	0	0	3	1	0	0	0	3	100
1 910.8	1.114	0,g^+	0	1	0	0	0	0	0	1	3	100
1 921.5	1.124	1,u	0	0	0	2	2	1	−1	0	3	76
1 941.1	1.124	1,u	0	0	0	2	0	1	1	0	3	76
2 036.7	1.124	1,g	0	0	0	1	1	2	0	0	3	51
		1,g	0	0	0	1	−1	2	2	0	3	49
2 053.6	1.124	1,g	0	0	0	1	1	2	0	0	3	49
		1,g	0	0	0	1	−1	2	2	0	3	51
2 164.7	1.125	1,u	0	0	0	0	0	3	1	0	3	100
2 449.0	1.124	0,g^+	0	0	0	4	0	0	0	0	4	100
2 452.2	1.124	2,g	0	0	0	4	2	0	0	0	4	100
2 502.7	1.115	1,g	0	1	0	1	1	0	0	1	4	100
2 531.8	1.125	0,u^+	0	0	0	3	1	1	−1	0	4	100
2 532.5	1.125	2,u	0	0	0	3	3	1	−1	0	4	85
2 555.6	1.125	0,u^-	0	0	0	3	−1	1	1	0	4	100
2 561.3	1.125	2,u	0	0	0	3	1	1	1	0	4	85
2 626.7	1.125	0,g^+	0	0	0	2	2	2	−2	0	4	64
		0,g^+	0	0	0	2	0	2	0	0	4	36
2 637.1	1.116	1,u	0	1	0	0	0	1	1	1	4	100
2 639.4	1.125	0,g^-	0	0	0	2	−2	2	2	0	4	100
2 644.5	1.125	2,g	0	0	0	2	2	2	0	0	4	70
		2,g	0	0	0	2	0	2	2	0	4	30
2 661.8	1.125	0,g^+	0	0	0	2	2	2	−2	0	4	36
		0,g^+	0	0	0	2	0	2	0	0	4	64
2 670.5	1.125	2,g	0	0	0	2	2	2	0	0	4	30
		2,g	0	0	0	2	0	2	2	0	4	70
2 743.6	1.126	0,u^+	0	0	0	1	1	3	−1	0	4	100
2 758.8	1.126	2,u	0	0	0	1	1	3	1	0	4	52
		2,u	0	0	0	1	−1	3	3	0	4	48
2 767.5	1.126	0,u^-	0	0	0	1	−1	3	1	0	4	100
2 779.5	1.126	2,u	0	0	0	1	1	3	1	0	4	48
		2,u	0	0	0	1	−1	3	3	0	4	52
2 872.7	1.127	0,g^+	0	0	0	0	0	4	0	0	4	100
2 886.3	1.127	2,g	0	0	0	0	0	4	2	0	4	100
3 077.5	1.125	1,g	0	0	0	5	1	0	0	0	5	100
3 099.0	1.116	0,g^+	0	1	0	2	0	0	0	1	5	100
3 102.4	1.116	2,g	0	1	0	2	2	0	0	1	5	100
3 148.4	1.126	1,u	0	0	0	4	2	1	−1	0	5	66
		1,u	0	0	0	4	0	1	1	0	5	34
3 179.3	1.126	1,u	0	0	0	4	2	1	−1	0	5	34
		1,u	0	0	0	4	0	1	1	0	5	66
3 213.9	1.117	0,u^+	0	1	0	1	1	1	−1	1	5	99
3 226.2	1.117	0,u^-	0	1	0	1	−1	1	1	1	5	100
3 231.0	1.127	1,g	0	0	0	3	3	2	−2	0	5	60
		1,g	0	0	0	3	1	2	0	0	5	30
3 233.5	1.117	2,u	0	1	0	1	1	1	1	1	5	100
3 251.8	1.127	1,g	0	0	0	3	3	2	−2	0	5	32
		1,g	0	0	0	3	−1	2	2	0	5	51
3 279.3	1.114	0,u^+	0	0	1	0	0	0	0	1	5	99
3 280.9	1.127	1,g	0	0	0	3	1	2	0	0	5	53
		1,g	0	0	0	3	−1	2	2	0	5	40
3 336.5	1.127	1,u	0	0	0	2	2	3	−1	0	5	36
		1,u	0	0	0	2	0	3	1	0	5	39

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
3 347.5	1.115	$0,g^+$	1	0	0	0	0	0	0	1	5	67
		$0,g^+$	0	1	0	0	0	2	0	1	5	33
3 354.2	1.116	$0,g^+$	1	0	0	0	0	0	0	1	5	33
		$0,g^+$	0	1	0	0	0	2	0	1	5	67
3 354.6	1.127	$1,u$	0	0	0	2	2	3	−1	0	5	42
		$1,u$	0	0	0	2	−2	3	3	0	5	58
3 365.7	1.118	$2,g$	0	1	0	0	0	2	2	1	5	100
3 382.2	1.127	$1,u$	0	0	0	2	0	3	1	0	5	61
3 453.6	1.128	$1,g$	0	0	0	1	1	4	0	0	5	51
		$1,g$	0	0	0	1	−1	4	2	0	5	49
3 482.8	1.128	$1,g$	0	0	0	1	1	4	0	0	5	49
		$1,g$	0	0	0	1	−1	4	2	0	5	51
3 582.9	1.129	$1,u$	0	0	0	0	0	5	1	0	5	100
3 703.0	1.117	$1,g$	0	1	0	3	1	0	0	1	6	100
3 710.5	1.126	$0,g^+$	0	0	0	6	0	0	0	0	6	100
3 713.7	1.126	$2,g$	0	0	0	6	2	0	0	0	6	100
3 770.8	1.127	$0,u^+$	0	0	0	5	1	1	−1	0	6	100
3 772.2	1.127	$2,u$	0	0	0	5	3	1	−1	0	6	76
3 805.7	1.118	$1,u$	0	1	0	2	2	1	−1	1	6	74
3 806.5	1.127	$0,u^-$	0	0	0	5	−1	1	1	0	6	100
3 807.1	1.108	$0,g^+$	0	2	0	0	0	0	0	2	6	100
3 811.5	1.127	$2,u$	0	0	0	5	1	1	1	0	6	76
3 825.9	1.118	$1,u$	0	1	0	2	2	1	−1	1	6	25
		$1,u$	0	1	0	2	0	1	1	1	6	75
3 841.6	1.128	$2,g$	0	0	0	4	4	2	−2	0	6	74
3 843.0	1.128	$0,g^+$	0	0	0	4	2	2	−2	0	6	58
		$0,g^+$	0	0	0	4	0	2	0	0	6	42
3 867.8	1.128	$0,g^-$	0	0	0	4	−2	2	2	0	6	100
3 871.9	1.128	$2,g$	0	0	0	4	2	2	0	0	6	36
		$2,g$	0	0	0	4	0	2	2	0	6	41
3 873.3	1.115	$1,u$	0	0	1	1	1	0	0	1	6	99
3 902.3	1.128	$0,g^+$	0	0	0	4	2	2	−2	0	6	42
		$0,g^+$	0	0	0	4	0	2	0	0	6	58
3 909.2	1.128	$2,g$	0	0	0	4	2	2	0	0	6	42
		$2,g$	0	0	0	4	0	2	2	0	6	55
3 927.7	1.128	$0,u^+$	0	0	0	3	3	3	−3	0	6	44
		$0,u^+$	0	0	0	3	1	3	−1	0	6	56
3 930.1	1.118	$1,g$	0	1	0	1	1	2	0	1	6	49
		$1,g$	0	1	0	1	−1	2	2	1	6	42
3 940.0	1.115	$1,g$	1	0	0	1	1	0	0	1	6	86
3 941.6	1.128	$0,u^-$	0	0	0	3	−3	3	3	0	6	88
3 943.7	1.128	$2,u$	0	0	0	3	3	3	−1	0	6	54
		$2,u$	0	0	0	3	1	3	1	0	6	35
3 948.8	1.118	$1,g$	0	1	0	1	1	2	0	1	6	51
		$1,g$	0	1	0	1	−1	2	2	1	6	44
3 963.8	1.128	$0,u^+$	0	0	0	3	3	3	−3	0	6	56
		$0,u^+$	0	0	0	3	1	3	−1	0	6	44
3 972.0	1.128	$2,u$	0	0	0	3	3	3	−1	0	6	35
		$2,u$	0	0	0	3	−1	3	3	0	6	54
3 997.6	1.128	$0,u^-$	0	0	0	3	−1	3	1	0	6	88
4 000.2	1.116	$1,g$	0	0	1	0	0	1	1	1	6	98
4 006.7	1.128	$2,u$	0	0	0	3	1	3	1	0	6	54
		$2,u$	0	0	0	3	−1	3	3	0	6	36
4 033.4	1.129	$0,g^+$	0	0	0	2	2	4	−2	0	6	58
		$0,g^+$	0	0	0	2	0	4	0	0	6	42
4 049.5	1.129	$2,g$	0	0	0	2	2	4	0	0	6	37
		$2,g$	0	0	0	2	0	4	2	0	6	41
4 058.2	1.129	$0,g^-$	0	0	0	2	−2	4	2	0	6	100
4 064.2	1.117	$1,u$	1	0	0	0	0	1	1	1	6	56
		$1,u$	0	1	0	0	0	3	1	1	6	44
4 072.1	1.129	$2,g$	0	0	0	2	2	4	0	0	6	39
		$2,g$	0	0	0	2	−2	4	4	0	6	61
4 073.2	1.118	$1,u$	1	0	0	0	0	1	1	1	6	44
		$1,u$	0	1	0	0	0	3	1	1	6	56

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
4 092.7	1.129	$0,g^+$	0	0	0	2	2	4	−2	0	6	42
		$0,g^+$	0	0	0	2	0	4	0	0	6	58
4 103.8	1.129	$2,g$	0	0	0	2	0	4	2	0	6	59
4 151.6	1.130	$0,u^+$	0	0	0	1	1	5	−1	0	6	100
4 166.3	1.130	$2,u$	0	0	0	1	1	5	1	0	6	51
		$2,u$	0	0	0	1	−1	5	3	0	6	49
4 187.4	1.130	$0,u^-$	0	0	0	1	−1	5	1	0	6	100
4 200.0	1.130	$2,u$	0	0	0	1	1	5	1	0	6	49
		$2,u$	0	0	0	1	−1	5	3	0	6	51
4 281.8	1.131	$0,g^+$	0	0	0	0	0	6	0	0	6	100
4 295.5	1.131	$2,g$	0	0	0	0	0	6	2	0	6	100
4 311.3	1.118	$0,g^+$	0	1	0	4	0	0	0	1	7	100
4 314.8	1.118	$2,g$	0	1	0	4	2	0	0	1	7	100
4 351.4	1.127	$1,g$	0	0	0	7	1	0	0	0	7	100
4 387.1	1.109	$1,g$	0	2	0	1	1	0	0	2	7	100
4 399.9	1.128	$1,u$	0	0	0	6	2	1	−1	0	7	62
		$1,u$	0	0	0	6	0	1	1	0	7	38
4 403.6	1.119	$0,u^+$	0	1	0	3	1	1	−1	1	7	99
4 404.7	1.119	$2,u$	0	1	0	3	3	1	−1	1	7	83
4 428.2	1.119	$0,u^-$	0	1	0	3	−1	1	1	1	7	100
4 434.0	1.119	$2,u$	0	1	0	3	1	1	1	1	7	84
4 442.4	1.128	$1,u$	0	0	0	6	2	1	−1	0	7	38
		$1,u$	0	0	0	6	0	1	1	0	7	62
4 460.2	1.129	$1,g$	0	0	0	5	3	2	−2	0	7	47
		$1,g$	0	0	0	5	1	2	0	0	7	39
4 471.8	1.116	$0,u^+$	0	0	1	2	0	0	0	1	7	99
4 475.0	1.116	$2,u$	0	0	1	2	2	0	0	1	7	99
4 492.2	1.129	$1,g$	0	0	0	5	3	2	−2	0	7	42
		$1,g$	0	0	0	5	−1	2	2	0	7	51
4 508.0	1.120	$0,g^+$	0	1	0	2	2	2	−2	1	7	61
		$0,g^+$	0	1	0	2	0	2	0	1	7	36
4 521.5	1.120	$0,g^-$	0	1	0	2	−2	2	2	1	7	99
4 525.6	1.119	$2,g$	0	1	0	2	2	2	0	1	7	64
		$2,g$	0	1	0	2	0	2	2	1	7	27
4 531.3	1.110	$1,u$	0	2	0	0	0	1	1	2	7	100
4 532.3	1.129	$1,u$	0	0	0	4	4	3	−3	0	7	49
		$1,u$	0	0	0	4	2	3	−1	0	7	32
4 533.3	1.129	$1,g$	0	0	0	5	1	2	0	0	7	53
		$1,g$	0	0	0	5	−1	2	2	0	7	35
4 534.1	1.116	$0,g^+$	1	0	0	2	0	0	0	1	7	91
4 538.4	1.116	$2,g$	1	0	0	2	2	0	0	1	7	90
4 545.1	1.119	$0,g^+$	0	1	0	2	2	2	−2	1	7	32
		$0,g^+$	0	1	0	2	0	2	0	1	7	63
4 553.4	1.120	$2,g$	0	1	0	2	2	2	0	1	7	32
		$2,g$	0	1	0	2	0	2	2	1	7	67
4 554.3	1.129	$1,u$	0	0	0	4	4	3	−3	0	7	36
		$1,u$	0	0	0	4	0	3	1	0	7	30
		$1,u$	0	0	0	4	−2	3	3	0	7	32
4 580.6	1.117	$0,g^+$	0	0	1	1	1	1	−1	1	7	96
4 584.0	1.129	$1,u$	0	0	0	4	2	3	−1	0	7	38
		$1,u$	0	0	0	4	−2	3	3	0	7	47
4 590.9	1.117	$0,g^-$	0	0	1	1	−1	1	1	1	7	99
4 599.1	1.117	$2,g$	0	0	1	1	1	1	1	1	7	97
4 623.9	1.129	$1,u$	0	0	0	4	2	3	−1	0	7	28
		$1,u$	0	0	0	4	0	3	1	0	7	53
4 627.6	1.130	$1,g$	0	0	0	3	3	4	−2	0	7	28
		$1,g$	0	0	0	3	1	4	0	0	7	34
		$1,g$	0	0	0	3	−1	4	2	0	7	26
4 632.8	1.120	$0,u^+$	0	1	0	1	1	3	−1	1	7	78
4 645.8	1.117	$0,u^+$	1	0	0	1	1	1	−1	1	7	79
4 647.6	1.130	$1,g$	0	0	0	3	3	4	−2	0	7	34
		$1,g$	0	0	0	3	−3	4	4	0	7	51
4 649.5	1.120	$2,u$	0	1	0	1	1	3	1	1	7	49
		$2,u$	0	1	0	1	−1	3	3	1	7	40

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
4 653.1	1.118	$0,u^-$	1	0	0	1	−1	1	1	1	7	71
		$0,u^-$	0	1	0	1	−1	3	1	1	7	29
4 662.8	1.117	$2,u$	1	0	0	1	1	1	1	1	7	82
4 663.0	1.119	$0,u^-$	1	0	0	1	−1	1	1	1	7	29
		$0,u^-$	0	1	0	1	−1	3	1	1	7	71
4 672.9	1.120	$2,u$	0	1	0	1	1	3	1	1	7	51
		$2,u$	0	1	0	1	−1	3	3	1	7	42
4 674.9	1.130	$1,g$	0	0	0	3	3	4	−2	0	7	30
		$1,g$	0	0	0	3	−3	4	4	0	7	31
4 709.5	1.118	$0,u^+$	0	0	1	0	0	2	0	1	7	98
4 714.2	1.130	$1,g$	0	0	0	3	1	4	0	0	7	45
		$1,g$	0	0	0	3	−1	4	2	0	7	41
4 723.3	1.118	$2,u$	0	0	1	0	0	2	2	1	7	97
4 733.9	1.131	$1,u$	0	0	0	2	2	5	−1	0	7	31
		$1,u$	0	0	0	2	0	5	1	0	7	43
		$1,u$	0	0	0	2	−2	5	3	0	7	26
4 764.3	1.131	$1,u$	0	0	0	2	2	5	−1	0	7	47
		$1,u$	0	0	0	2	−2	5	3	0	7	53
4 768.9	1.119	$0,g^+$	1	0	0	0	0	2	0	1	7	49
		$0,g^+$	0	1	0	0	0	4	0	1	7	51
4 781.6	1.119	$0,g^+$	1	0	0	0	0	2	0	1	7	51
		$0,g^+$	0	1	0	0	0	4	0	1	7	49
4 783.4	1.119	$2,g$	1	0	0	0	0	2	2	1	7	49
		$2,g$	0	1	0	0	0	4	2	1	7	51
4 794.4	1.119	$2,g$	1	0	0	0	0	2	2	1	7	51
		$2,g$	0	1	0	0	0	4	2	1	7	49
4 804.2	1.131	$1,u$	0	0	0	2	0	5	1	0	7	57
4 852.4	1.132	$1,g$	0	0	0	1	1	6	0	0	7	50
		$1,g$	0	0	0	1	−1	6	2	0	7	50
4 893.7	1.132	$1,g$	0	0	0	1	1	6	0	0	7	50
		$1,g$	0	0	0	1	−1	6	2	0	7	50
4 927.3	1.119	$1,g$	0	1	0	5	1	0	0	1	8	99
4 971.4	1.110	$0,g^+$	0	2	0	2	0	0	0	2	8	100
4 975.0	1.110	$2,g$	0	2	0	2	2	0	0	2	8	100
4 983.0	1.133	$1,u$	0	0	0	0	0	7	1	0	7	100
4 996.7	1.128	$0,g^+$	0	0	0	8	0	0	0	0	8	100
4 999.9	1.128	$2,g$	0	0	0	8	2	0	0	0	8	100
5 007.8	1.120	$1,u$	0	1	0	4	2	1	−1	1	8	65
		$1,u$	0	1	0	4	0	1	1	1	8	34
5 034.4	1.129	$0,u^+$	0	0	0	7	1	1	−1	0	8	100
5 036.3	1.129	$2,u$	0	0	0	7	3	1	−1	0	8	70
		$2,u$	0	0	0	7	1	1	1	0	8	30
5 039.6	1.120	$1,u$	0	1	0	4	2	1	−1	1	8	34
		$1,u$	0	1	0	4	0	1	1	1	8	65
5 078.1	1.117	$1,u$	0	0	1	3	1	0	0	1	8	99
5 082.1	1.129	$0,u^-$	0	0	0	7	−1	1	1	0	8	100
5 083.9	1.130	$2,g$	0	0	0	6	4	2	−2	0	8	59
		$2,g$	0	0	0	6	2	2	0	0	8	33
5 084.1	1.130	$0,g^+$	0	0	0	6	2	2	−2	0	8	56
		$0,g^+$	0	0	0	6	0	2	0	0	8	44
5 086.7	1.129	$2,u$	0	0	0	7	3	1	−1	0	8	30
		$2,u$	0	0	0	7	1	1	1	0	8	70
5 096.0	1.111	$0,u^+$	0	2	0	1	1	1	−1	2	8	99
5 100.0	1.121	$1,g$	0	1	0	3	3	2	−2	1	8	57
		$1,g$	0	1	0	3	1	2	0	1	8	30
5 108.6	1.111	$0,u^-$	0	2	0	1	−1	1	1	2	8	100
5 115.8	1.111	$2,u$	0	2	0	1	1	1	1	2	8	100
5 120.9	1.130	$0,g^-$	0	0	0	6	−2	2	2	0	8	100
5 121.2	1.121	$1,g$	0	1	0	3	3	2	−2	1	8	34
		$1,g$	0	1	0	3	−1	2	2	1	8	48
5 124.6	1.130	$2,g$	0	0	0	6	4	2	−2	0	8	34
		$2,g$	0	0	0	6	0	2	2	0	8	45
5 136.9	1.117	$1,g$	1	0	0	3	1	0	0	1	8	90
5 142.6	1.131	$2,u$	0	0	0	5	5	3	−3	0	8	64

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		2,u	0	0	0	5	3	3	−1	0	8	27
5 145.9	1.131	0,u^+	0	0	0	5	3	3	−3	0	8	36
		0,u^+	0	0	0	5	1	3	−1	0	8	64
5 151.7	1.121	1,g	0	1	0	3	1	2	0	1	8	54
		1,g	0	1	0	3	−1	2	2	1	8	37
5 167.3	1.130	0,g^+	0	0	0	6	2	2	−2	0	8	44
		0,g^+	0	0	0	6	0	2	0	0	8	56
5 171.9	1.131	0,u^-	0	0	0	5	−3	3	3	0	8	84
5 173.3	1.130	2,g	0	0	0	6	2	2	0	0	8	46
		2,g	0	0	0	6	0	2	2	0	8	47
5 174.2	1.131	2,u	0	0	0	5	5	3	−3	0	8	28
		2,u	0	0	0	5	1	3	1	0	8	38
5 175.5	1.118	1,g	0	0	1	2	2	1	−1	1	8	75
5 185.5	1.108	0,u^+	0	1	1	0	0	0	0	2	8	99
5 193.1	1.118	1,g	0	0	1	2	0	1	1	1	8	77
5 206.6	1.131	0,u^+	0	0	0	5	3	3	−3	0	8	64
		0,u^+	0	0	0	5	1	3	−1	0	8	36
5 212.8	1.131	2,u	0	0	0	5	3	3	−1	0	8	41
		2,u	0	0	0	5	−1	3	3	0	8	51
5 214.2	1.121	1,u	0	1	0	2	2	3	−1	1	8	34
		1,u	0	1	0	2	0	3	1	1	8	36
5 220.4	1.131	0,g^+	0	0	0	4	4	4	−4	0	8	30
		0,g^+	0	0	0	4	2	4	−2	0	8	44
		0,g^+	0	0	0	4	0	4	0	0	8	25
5 231.8	1.120	1,u	1	0	0	2	2	1	−1	1	8	35
		1,u	0	1	0	2	−2	3	3	1	8	42
5 234.5	1.131	2,g	0	0	0	4	4	4	−2	0	8	43
		2,g	0	0	0	4	2	4	0	0	8	36
5 235.8	1.131	0,g^-	0	0	0	4	−4	4	4	0	8	76
5 236.9	1.119	1,u	1	0	0	2	2	1	−1	1	8	32
		1,u	0	1	0	2	2	3	−1	1	8	30
5 241.7	1.111	0,g^+	0	2	0	0	0	2	0	2	8	78
5 252.2	1.131	0,u^-	0	0	0	5	−1	3	1	0	8	84
5 252.5	1.118	1,u	1	0	0	2	0	1	1	1	8	60
5 252.5	1.109	0,g^+	1	1	0	0	0	0	0	2	8	78
5 257.8	1.112	2,g	0	2	0	0	0	2	2	2	8	100
5 257.9	1.131	0,g^+	0	0	0	4	4	4	−4	0	8	66
		0,g^+	0	0	0	4	0	4	0	0	8	25
5 259.7	1.131	2,u	0	0	0	5	1	3	1	0	8	52
		2,u	0	0	0	5	−1	3	3	0	8	29
5 264.2	1.121	1,u	0	1	0	2	0	3	1	1	8	55
5 265.1	1.131	2,g	0	0	0	4	4	4	−2	0	8	36
		2,g	0	0	0	4	0	4	2	0	8	30
		2,g	0	0	0	4	−2	4	4	0	8	34
5 291.6	1.131	0,g^-	0	0	0	4	−2	4	2	0	8	76
5 292.8	1.119	1,u	0	0	1	1	1	2	0	1	8	49
		1,u	0	0	1	1	−1	2	2	1	8	45
5 300.6	1.131	2,g	0	0	0	4	2	4	0	0	8	32
		2,g	0	0	0	4	−2	4	4	0	8	47
5 307.6	1.119	1,u	0	0	1	1	1	2	0	1	8	47
		1,u	0	0	1	1	−1	2	2	1	8	51
5 314.9	1.132	0,u^+	0	0	0	3	3	5	−3	0	8	36
		0,u^+	0	0	0	3	1	5	−1	0	8	64
5 331.1	1.132	2,u	0	0	0	3	3	5	−1	0	8	29
		2,u	0	0	0	3	1	5	1	0	8	37
5 336.8	1.131	0,g^+	0	0	0	4	2	4	−2	0	8	47
		0,g^+	0	0	0	4	0	4	0	0	8	50
5 339.5	1.122	1,g	0	1	0	1	1	4	0	1	8	39
		1,g	0	1	0	1	−1	4	2	1	8	37
5 340.9	1.132	0,u^-	0	0	0	3	−3	5	3	0	8	84
5 345.9	1.131	2,g	0	0	0	4	2	4	0	0	8	32
		2,g	0	0	0	4	0	4	2	0	8	50
5 356.0	1.119	1,g	1	0	0	1	1	2	0	1	8	39
		1,g	1	0	0	1	−1	2	2	1	8	37

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
5 356.7	1.132	2,u	0	0	0	3	3	5	−1	0	8	31
		2,u	0	0	0	3	−3	5	5	0	8	52
5 365.8	1.120	1,g	1	0	0	1	1	2	0	1	8	29
		1,g	1	0	0	1	−1	2	2	1	8	34
5 375.6	1.132	0,u^+	0	0	0	3	3	5	−3	0	8	64
		0,u^+	0	0	0	3	1	5	−1	0	8	36
5 377.9	1.121	1,g	0	1	0	1	1	4	0	1	8	32
		1,g	0	1	0	1	−1	4	2	1	8	30
5 387.7	1.132	2,u	0	0	0	3	3	5	−1	0	8	29
		2,u	0	0	0	3	−3	5	5	0	8	33
5 421.1	1.120	1,g	0	0	1	0	0	3	1	1	8	97
5 421.2	1.132	0,u^-	0	0	0	3	−1	5	1	0	8	84
5 422.1	1.133	0,g^+	0	0	0	2	2	6	−2	0	8	56
		0,g^+	0	0	0	2	0	6	0	0	8	44
5 431.8	1.132	2,u	0	0	0	3	1	5	1	0	8	46
		2,u	0	0	0	3	−1	5	3	0	8	39
5 437.5	1.133	2,g	0	0	0	2	2	6	0	0	8	32
		2,g	0	0	0	2	0	6	2	0	8	44
5 458.9	1.133	0,g^-	0	0	0	2	−2	6	2	0	8	100
5 472.6	1.133	2,g	0	0	0	2	2	6	0	0	8	45
		2,g	0	0	0	2	−2	6	4	0	8	55
5 476.2	1.122	1,u	1	0	0	0	0	3	1	1	8	45
		1,u	0	1	0	0	0	5	1	1	8	55
5 491.8	1.121	1,u	1	0	0	0	0	3	1	1	8	55
		1,u	0	1	0	0	0	5	1	1	8	45
5 505.3	1.133	0,g^+	0	0	0	2	2	6	−2	0	8	44
		0,g^+	0	0	0	2	0	6	0	0	8	56
5 517.2	1.133	2,g	0	0	0	2	0	6	2	0	8	56
5 541.5	1.134	0,u^+	0	0	0	1	1	7	−1	0	8	100
5 547.5	1.120	0,g^+	0	1	0	6	0	0	0	1	9	99
5 551.0	1.120	2,g	0	1	0	6	2	0	0	1	9	99
5 555.9	1.134	2,u	0	0	0	1	1	7	1	0	8	51
		2,u	0	0	0	1	−1	7	3	0	8	49
5 563.3	1.111	1,g	0	2	0	3	1	0	0	2	9	100
5 589.2	1.134	0,u^-	0	0	0	1	−1	7	1	0	8	100
5 602.1	1.134	2,u	0	0	0	1	1	7	1	0	8	49
		2,u	0	0	0	1	−1	7	3	0	8	51
5 617.3	1.121	0,u^+	0	1	0	5	1	1	−1	1	9	98
5 619.2	1.121	2,u	0	1	0	5	3	1	−1	1	9	73
5 649.9	1.129	1,g	0	0	0	9	1	0	0	0	9	100
5 654.2	1.121	0,u^-	0	1	0	5	−1	1	1	1	9	99
5 659.3	1.121	2,u	0	1	0	5	3	1	−1	1	9	25
		2,u	0	1	0	5	1	1	1	1	9	74
5 672.8	1.135	0,g^+	0	0	0	0	0	8	0	0	8	100
5 675.9	1.112	1,u	0	2	0	2	2	1	−1	2	9	74
		1,u	0	2	0	2	0	1	1	2	9	25
5 676.0	1.130	1,u	0	0	0	8	2	1	−1	0	9	59
		1,u	0	0	0	8	0	1	1	0	9	41
5 686.4	1.135	2,g	0	0	0	0	0	8	2	0	8	100
5 688.8	1.102	0,g^+	0	3	0	0	0	0	0	3	9	100
5 689.0	1.118	0,u^+	0	0	1	4	0	0	0	1	9	98
5 692.2	1.118	2,u	0	0	1	4	2	0	0	1	9	98
5 696.2	1.112	1,u	0	2	0	2	2	1	−1	2	9	26
		1,u	0	2	0	2	0	1	1	2	9	74
5 698.4	1.122	2,g	0	1	0	4	4	2	−2	1	9	70
5 699.0	1.122	0,g^+	0	1	0	4	2	2	−2	1	9	55
		0,g^+	0	1	0	4	0	2	0	1	9	41
5 713.9	1.131	1,g	0	0	0	7	3	2	−2	0	9	41
		1,g	0	0	0	7	1	2	0	0	9	43
5 725.0	1.122	0,g^-	0	1	0	4	−2	2	2	1	9	98
5 728.8	1.122	2,g	0	1	0	4	2	2	0	1	9	32
		2,g	0	1	0	4	0	2	2	1	9	39
5 730.3	1.130	1,u	0	0	0	8	2	1	−1	0	9	41
		1,u	0	0	0	8	0	1	1	0	9	59

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
5 743.5	1.118	$0,g^+$	1	0	0	4	0	0	0	1	9	87
5 747.1	1.118	$2,g$	1	0	0	4	2	0	0	1	9	87
5 757.5	1.131	$1,g$	0	0	0	7	3	2	−2	0	9	45
		$1,g$	0	0	0	7	−1	2	2	0	9	50
5 760.6	1.122	$0,g^+$	0	1	0	4	2	2	−2	1	9	39
		$0,g^+$	0	1	0	4	0	2	0	1	9	59
5 763.7	1.132	$1,u$	0	0	0	6	4	3	−3	0	9	34
		$1,u$	0	0	0	6	2	3	−1	0	9	37
5 767.4	1.122	$2,g$	0	1	0	4	2	2	0	1	9	44
		$2,g$	0	1	0	4	0	2	2	1	9	51
5 767.7	1.110	$1,u$	0	1	1	1	1	0	0	2	9	99
5 777.5	1.119	$2,g$	0	0	1	3	3	1	−1	1	9	81
5 778.0	1.119	$0,g^+$	0	0	1	3	1	1	−1	1	9	87
5 793.3	1.122	$0,u^+$	0	1	0	3	3	3	−3	1	9	40
		$0,u^+$	0	1	0	3	1	3	−1	1	9	54
5 796.9	1.132	$1,u$	0	0	0	6	4	3	−3	0	9	42
		$1,u$	0	0	0	6	−2	3	3	0	9	33
5 797.4	1.119	$0,g^-$	0	0	1	3	−1	1	1	1	9	98
5 803.9	1.119	$2,g$	0	0	1	3	1	1	1	1	9	85
5 808.3	1.123	$0,u^-$	0	1	0	3	−3	3	3	1	9	85
5 809.0	1.122	$2,u$	0	1	0	3	3	3	−1	1	9	48
		$2,u$	0	1	0	3	1	3	1	1	9	32
5 810.0	1.113	$1,g$	0	2	0	1	1	2	0	2	9	51
		$1,g$	0	2	0	1	−1	2	2	2	9	44
5 810.5	1.131	$1,g$	0	0	0	7	1	2	0	0	9	53
		$1,g$	0	0	0	7	−1	2	2	0	9	33
5 825.5	1.132	$1,g$	0	0	0	5	5	4	−4	0	9	39
		$1,g$	0	0	0	5	3	4	−2	0	9	31
5 826.0	1.111	$1,g$	1	1	0	1	1	0	0	2	9	41
		$1,g$	0	2	0	1	−1	2	2	2	9	42
5 827.3	1.120	$0,u^+$	1	0	0	3	1	1	−1	1	9	57
		$0,u^+$	0	1	0	3	3	3	−3	1	9	31
5 831.7	1.119	$2,u$	1	0	0	3	3	1	−1	1	9	73
5 832.0	1.111	$1,g$	1	1	0	1	1	0	0	2	9	54
		$1,g$	0	2	0	1	1	2	0	2	9	31
5 833.6	1.121	$0,u^+$	1	0	0	3	1	1	−1	1	9	33
		$0,u^+$	0	1	0	3	3	3	−3	1	9	27
		$0,u^+$	0	1	0	3	1	3	−1	1	9	36
5 838.6	1.132	$1,u$	0	0	0	6	2	3	−1	0	9	32
		$1,u$	0	0	0	6	−2	3	3	0	9	44
5 839.3	1.122	$2,u$	0	1	0	3	3	3	−1	1	9	39
		$2,u$	0	1	0	3	−1	3	3	1	9	44
5 848.5	1.132	$1,g$	0	0	0	5	5	4	−4	0	9	38
		$1,g$	0	0	0	5	−1	4	2	0	9	28
5 853.4	1.119	$0,u^-$	1	0	0	3	−1	1	1	1	9	85
5 859.7	1.119	$2,u$	1	0	0	3	1	1	1	1	9	70
5 867.2	1.122	$0,u^-$	0	1	0	3	−1	3	1	1	9	82
5 874.9	1.120	$0,u^+$	0	0	1	2	2	2	−2	1	9	60
		$0,u^+$	0	0	1	2	0	2	0	1	9	30
5 875.6	1.122	$2,u$	0	1	0	3	1	3	1	1	9	54
		$2,u$	0	1	0	3	−1	3	3	1	9	30
5 879.1	1.132	$1,g$	0	0	0	5	−3	4	4	0	9	43
5 885.8	1.120	$0,u^-$	0	0	1	2	−2	2	2	1	9	91
5 890.5	1.132	$1,u$	0	0	0	6	2	3	−1	0	9	31
		$1,u$	0	0	0	6	0	3	1	0	9	49
5 892.1	1.120	$2,u$	0	0	1	2	2	2	0	1	9	69
5 904.2	1.110	$1,g$	0	1	1	0	0	1	1	2	9	99
5 905.6	1.120	$0,u^+$	0	0	1	2	2	2	−2	1	9	34
		$0,u^+$	0	0	1	2	0	2	0	1	9	64
5 907.4	1.123	$0,g^+$	0	1	0	2	2	4	−2	1	9	49
		$0,g^+$	0	1	0	2	0	4	0	1	9	36
5 910.2	1.133	$1,u$	0	0	0	4	2	5	−1	0	9	30
		$1,u$	0	0	0	4	0	5	1	0	9	26
5 915.4	1.120	$2,u$	0	0	1	2	2	2	0	1	9	26

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		2,*u*	0	0	1	2	0	2	2	1	9	70
5 919.1	1.132	1,*g*	0	0	0	5	3	4	−2	0	9	34
		1,*g*	0	0	0	5	−3	4	4	0	9	29
5 924.1	1.123	2,*g*	0	1	0	2	2	4	0	1	9	34
		2,*g*	0	1	0	2	0	4	2	1	9	36
5 930.8	1.120	$0,g^+$	1	0	0	2	2	2	−2	1	9	53
		$0,g^+$	1	0	0	2	0	2	0	1	9	31
5 931.9	1.122	$0,g^-$	1	0	0	2	−2	2	2	1	9	27
		$0,g^-$	0	1	0	2	−2	4	2	1	9	71
5 932.6	1.133	1,*u*	0	0	0	4	4	5	−3	0	9	29
		1,*u*	0	0	0	4	−4	5	5	0	9	41
5 945.2	1.121	2,*g*	1	0	0	2	2	2	0	1	9	42
		2,*g*	0	1	0	2	−2	4	4	1	9	36
5 946.1	1.121	$0,g^-$	1	0	0	2	−2	2	2	1	9	72
		$0,g^-$	0	1	0	2	−2	4	2	1	9	28
5 951.5	1.122	2,*g*	0	1	0	2	2	4	0	1	9	36
5 955.6	1.113	1,*u*	1	1	0	0	0	1	1	2	9	25
		1,*u*	0	2	0	0	0	3	1	2	9	75
5 959.8	1.133	1,*u*	0	0	0	4	4	5	−3	0	9	30
		1,*u*	0	0	0	4	−4	5	5	0	9	39
5 961.4	1.121	$0,g^+$	1	0	0	2	2	2	−2	1	9	29
		$0,g^+$	1	0	0	2	0	2	0	1	9	43
5 970.2	1.111	1,*u*	1	1	0	0	0	1	1	2	9	75
		1,*u*	0	2	0	0	0	3	1	2	9	25
5 970.2	1.132	1,*g*	0	0	0	5	1	4	0	0	9	44
		1,*g*	0	0	0	5	−1	4	2	0	9	36
5 971.3	1.120	2,*g*	1	0	0	2	2	2	0	1	9	27
		2,*g*	1	0	0	2	0	2	2	1	9	53
5 974.7	1.122	$0,g^+$	0	1	0	2	2	4	−2	1	9	29
		$0,g^+$	0	1	0	2	0	4	0	1	9	45
5 984.3	1.123	2,*g*	0	1	0	2	0	4	2	1	9	50
5 992.6	1.121	$0,g^+$	0	0	1	1	1	3	−1	1	9	92
5 998.9	1.133	1,*u*	0	0	0	4	2	5	−1	0	9	33
		1,*u*	0	0	0	4	−2	5	3	0	9	39
6 005.8	1.134	1,*g*	0	0	0	3	1	6	0	0	9	35
		1,*g*	0	0	0	3	−1	6	2	0	9	30
6 007.8	1.121	2,*g*	0	0	1	1	1	3	1	1	9	50
		2,*g*	0	0	1	1	−1	3	3	1	9	43
6 013.6	1.121	$0,g^-$	0	0	1	1	−1	3	1	1	9	98
6 026.1	1.121	2,*g*	0	0	1	1	1	3	1	1	9	46
		2,*g*	0	0	1	1	−1	3	3	1	9	51
6 033.8	1.123	$0,u^+$	1	0	0	1	1	3	−1	1	9	25
		$0,u^+$	0	1	0	1	1	5	−1	1	9	72
6 037.6	1.134	1,*g*	0	0	0	3	3	6	−2	0	9	38
		1,*g*	0	0	0	3	−3	6	4	0	9	45
6 049.2	1.123	2,*u*	0	1	0	1	1	5	1	1	9	39
		2,*u*	0	1	0	1	−1	5	3	1	9	36
6 049.7	1.133	1,*u*	0	0	0	4	2	5	−1	0	9	27
		1,*u*	0	0	0	4	0	5	1	0	9	48
6 054.2	1.121	$0,u^+$	1	0	0	1	1	3	−1	1	9	73
		$0,u^+$	0	1	0	1	1	5	−1	1	9	27
6 067.3	1.122	$0,u^-$	1	0	0	1	−1	3	1	1	9	55
		$0,u^-$	0	1	0	1	−1	5	1	1	9	45
6 068.7	1.121	2,*u*	1	0	0	1	1	3	1	1	9	39
		2,*u*	1	0	0	1	−1	3	3	1	9	36
6 077.8	1.134	1,*g*	0	0	0	3	3	6	−2	0	9	32
		1,*g*	0	0	0	3	−3	6	4	0	9	34
6 080.4	1.122	2,*u*	1	0	0	1	1	3	1	1	9	25
		2,*u*	1	0	0	1	−1	3	3	1	9	32
6 082.9	1.123	$0,u^-$	1	0	0	1	−1	3	1	1	9	45
		$0,u^-$	0	1	0	1	−1	5	1	1	9	55
6 094.3	1.123	2,*u*	0	1	0	1	1	5	1	1	9	30
		2,*u*	0	1	0	1	−1	5	3	1	9	27
6 113.4	1.135	1,*u*	0	0	0	2	2	7	−1	0	9	29

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		1,*u*	0	0	0	2	0	7	1	0	9	45
		1,*u*	0	0	0	2	−2	7	3	0	9	26
6 121.3	1.122	0,u^+	0	0	1	0	0	4	0	1	9	97
6 128.9	1.134	1,*g*	0	0	0	3	1	6	0	0	9	43
		1,*g*	0	0	0	3	−1	6	2	0	9	40
6 135.1	1.122	2,*u*	0	0	1	0	0	4	2	1	9	96
6 155.8	1.135	1,*u*	0	0	0	2	2	7	−1	0	9	48
		1,*u*	0	0	0	2	−2	7	3	0	9	52
6 159.4	1.112	0,g^+	0	2	0	4	0	0	0	2	10	99
6 163.0	1.112	2,*g*	0	2	0	4	2	0	0	2	10	99
6 171.9	1.124	0,g^+	1	0	0	0	0	4	0	1	9	43
		0,g^+	0	1	0	0	0	6	0	1	9	57
6 175.4	1.121	1,*g*	0	1	0	7	1	0	0	1	10	98
6 186.1	1.124	2,*g*	1	0	0	0	0	4	2	1	9	42
		2,*g*	0	1	0	0	0	6	2	1	9	58
6 191.1	1.123	0,g^+	1	0	0	0	0	4	0	1	9	57
		0,g^+	0	1	0	0	0	6	0	1	9	43
6 204.2	1.123	2,*g*	1	0	0	0	0	4	2	1	9	58
		2,*g*	0	1	0	0	0	6	2	1	9	42
6 207.9	1.135	1,*u*	0	0	0	2	0	7	1	0	9	55
6 233.2	1.136	1,*g*	0	0	0	1	1	8	0	0	9	50
		1,*g*	0	0	0	1	−1	8	2	0	9	50
6 233.6	1.122	1,*u*	0	1	0	6	2	1	−1	1	10	60
		1,*u*	0	1	0	6	0	1	1	1	10	37
6 257.0	1.103	1,*g*	0	3	0	1	1	0	0	3	10	100
6 261.4	1.113	0,u^+	0	2	0	3	1	1	−1	2	10	98
6 262.9	1.113	2,*u*	0	2	0	3	3	1	−1	2	10	83
6 277.3	1.122	1,*u*	0	1	0	6	2	1	−1	1	10	38
		1,*u*	0	1	0	6	0	1	1	1	10	60
6 286.5	1.136	1,*g*	0	0	0	1	1	8	0	0	9	50
		1,*g*	0	0	0	1	−1	8	2	0	9	50
6 286.5	1.113	0,u^-	0	2	0	3	−1	1	1	2	10	100
6 292.3	1.113	2,*u*	0	2	0	3	1	1	1	2	10	83
6 303.6	1.123	1,*g*	0	1	0	5	3	2	−2	1	10	44
		1,*g*	0	1	0	5	1	2	0	1	10	38
6 307.6	1.119	1,*u*	0	0	1	5	1	0	0	1	10	98
6 307.6	1.130	0,g^+	0	0	0	10	0	0	0	0	10	100
6 310.8	1.130	2,*g*	0	0	0	10	2	0	0	0	10	100
6 322.7	1.131	0,u^+	0	0	0	9	1	1	−1	0	10	100
6 324.9	1.131	2,*u*	0	0	0	9	3	1	−1	0	10	66
		2,*u*	0	0	0	9	1	1	1	0	10	34
6 336.6	1.123	1,*g*	0	1	0	5	3	2	−2	1	10	42
		1,*g*	0	1	0	5	−1	2	2	1	10	48
6 349.8	1.132	0,g^+	0	0	0	8	2	2	−2	0	10	54
		0,g^+	0	0	0	8	0	2	0	0	10	46
6 350.5	1.132	2,*g*	0	0	0	8	4	2	−2	0	10	51
		2,*g*	0	0	0	8	2	2	0	0	10	39
6 354.1	1.111	0,u^+	0	1	1	2	0	0	0	2	10	98
6 357.6	1.111	2,*u*	0	1	1	2	2	0	0	2	10	99
6 357.7	1.119	1,*g*	1	0	0	5	1	0	0	1	10	78
6 364.9	1.137	1,*u*	0	0	0	0	0	9	1	0	9	100
6 375.6	1.114	0,g^+	0	2	0	2	2	2	−2	2	10	60
		0,g^+	0	2	0	2	0	2	0	2	10	36
6 378.9	1.123	1,*g*	0	1	0	5	1	2	0	1	10	54
		1,*g*	0	1	0	5	−1	2	2	1	10	32
6 382.4	1.131	0,u^-	0	0	0	9	−1	1	1	0	10	100
6 385.5	1.124	1,*u*	0	1	0	4	4	3	−3	1	10	43
		1,*u*	0	1	0	4	2	3	−1	1	10	31
6 386.7	1.131	2,*u*	0	0	0	9	3	1	−1	0	10	34
		2,*u*	0	0	0	9	1	1	1	0	10	66
6 386.8	1.120	1,*g*	0	0	1	4	2	1	−1	1	10	56
6 387.4	1.133	2,*u*	0	0	0	7	5	3	−3	0	10	47
		2,*u*	0	0	0	7	3	3	−1	0	10	36
6 389.0	1.133	0,u^+	0	0	0	7	3	3	−3	0	10	33

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,u^+$	0	0	0	7	1	3	−1	0	10	67
6 389.5	1.114	$0,g^-$	0	2	0	2	−2	2	2	2	10	99
6 393.5	1.114	$2,g$	0	2	0	2	2	2	0	2	10	66
		$2,g$	0	2	0	2	0	2	2	2	10	28
6 398.6	1.132	$0,g^-$	0	0	0	8	−2	2	2	0	10	100
6 402.1	1.132	$2,g$	0	0	0	8	4	2	−2	0	10	40
		$2,g$	0	0	0	8	0	2	2	0	10	47
6 408.0	1.124	$1,u$	0	1	0	4	4	3	−3	1	10	38
		$1,u$	0	1	0	4	0	3	1	1	10	27
		$1,u$	0	1	0	4	−2	3	3	1	10	29
6 408.8	1.112	$0,g^+$	1	1	0	2	0	0	0	2	10	55
6 410.9	1.104	$1,u$	0	3	0	0	0	1	1	3	10	100
6 411.5	1.120	$1,g$	0	0	1	4	2	1	−1	1	10	30
		$1,g$	0	0	1	4	0	1	1	1	10	67
6 415.1	1.110	$2,g$	1	1	0	2	2	0	0	2	10	84
6 415.8	1.112	$0,g^+$	1	1	0	2	0	0	0	2	10	41
		$0,g^+$	0	2	0	2	0	2	0	2	10	42
6 422.2	1.113	$2,g$	0	2	0	2	2	2	0	2	10	33
		$2,g$	0	2	0	2	0	2	2	2	10	56
6 427.0	1.133	$0,u^-$	0	0	0	7	−3	3	3	0	10	82
6 429.4	1.133	$2,u$	0	0	0	7	5	3	−3	0	10	38
		$2,u$	0	0	0	7	1	3	1	0	10	35
6 431.2	1.120	$1,u$	1	0	0	4	2	1	−1	1	10	52
6 435.7	1.133	$2,g$	0	0	0	6	6	4	−4	0	10	55
		$2,g$	0	0	0	6	4	4	−2	0	10	29
6 439.6	1.123	$1,u$	0	1	0	4	2	3	−1	1	10	38
		$1,u$	0	1	0	4	−2	3	3	1	10	36
6 440.3	1.133	$0,g^+$	0	0	0	6	2	4	−2	0	10	48
		$0,g^+$	0	0	0	6	0	4	0	0	10	29
6 457.0	1.132	$0,g^+$	0	0	0	8	2	2	−2	0	10	46
		$0,g^+$	0	0	0	8	0	2	0	0	10	54
6 462.4	1.132	$2,g$	0	0	0	8	2	2	0	0	10	48
		$2,g$	0	0	0	8	0	2	2	0	10	42
6 463.3	1.120	$1,u$	1	0	0	4	2	1	−1	1	10	27
		$1,u$	1	0	0	4	0	1	1	1	10	53
6 467.8	1.133	$0,g^-$	0	0	0	6	−4	4	4	0	10	68
		$0,g^-$	0	0	0	6	−2	4	2	0	10	32
6 468.2	1.133	$2,g$	0	0	0	6	6	4	−4	0	10	31
		$2,g$	0	0	0	6	2	4	0	0	10	28
		$2,g$	0	0	0	6	0	4	2	0	10	26
6 470.2	1.111	$0,g^+$	0	1	1	1	1	1	−1	2	10	84
6 470.9	1.121	$1,u$	0	0	1	3	3	2	−2	1	10	56
6 473.9	1.133	$0,u^+$	0	0	0	7	3	3	−3	0	10	67
		$0,u^+$	0	0	0	7	1	3	−1	0	10	33
6 479.1	1.133	$2,u$	0	0	0	7	3	3	−1	0	10	38
		$2,u$	0	0	0	7	−1	3	3	0	10	48
6 480.5	1.123	$1,u$	0	1	0	4	2	3	−1	1	10	27
		$1,u$	0	1	0	4	0	3	1	1	10	52
6 483.3	1.111	$0,g^-$	0	1	1	1	−1	1	1	2	10	99
6 489.4	1.124	$1,g$	0	1	0	3	1	4	0	1	10	31
6 490.5	1.109	$0,g^+$	0	0	2	0	0	0	0	2	10	79
6 490.7	1.121	$1,u$	0	0	1	3	−1	2	2	1	10	39
6 491.3	1.111	$2,g$	0	1	1	1	1	1	1	2	10	98
6 503.0	1.133	$0,g^+$	0	0	0	6	4	4	−4	0	10	71
6 504.6	1.134	$0,u^+$	0	0	0	5	3	5	−3	0	10	35
		$0,u^+$	0	0	0	5	1	5	−1	0	10	44
6 508.1	1.133	$2,g$	0	0	0	6	4	4	−2	0	10	32
		$2,g$	0	0	0	6	−2	4	4	0	10	36
6 510.2	1.114	$0,u^+$	0	2	0	1	1	3	−1	2	10	81
6 510.6	1.124	$1,g$	0	1	0	3	3	4	−2	1	10	26
		$1,g$	0	1	0	3	−3	4	4	1	10	47
6 515.1	1.121	$1,u$	0	0	1	3	1	2	0	1	10	51
		$1,u$	0	0	1	3	−1	2	2	1	10	40
6 516.9	1.134	$2,u$	0	0	0	5	5	5	−3	0	10	35

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		2,*u*	0	0	0	5	3	5	−1	0	10	34
6 521.0	1.121	1,*g*	1	0	0	3	3	2	−2	1	10	43
		1,*g*	1	0	0	3	1	2	0	1	10	27
6 521.9	1.134	0,u^-	0	0	0	5	−5	5	5	0	10	64
		0,u^-	0	0	0	5	−3	5	3	0	10	32
6 522.2	1.109	0,u^+	1	0	1	0	0	0	0	2	10	78
6 527.2	1.115	2,*u*	0	2	0	1	1	3	1	2	10	51
		2,*u*	0	2	0	1	−1	3	3	2	10	42
6 531.3	1.133	0,u^-	0	0	0	7	−1	3	1	0	10	82
6 533.8	1.113	0,u^-	1	1	0	1	−1	1	1	2	10	34
		0,u^-	0	2	0	1	−1	3	1	2	10	66
6 535.2	1.110	0,u^+	1	1	0	1	1	1	−1	2	10	73
6 535.3	1.123	1,*g*	0	1	0	3	−3	4	4	1	10	25
6 538.0	1.133	2,*u*	0	0	0	7	1	3	1	0	10	51
6 544.1	1.134	0,u^+	0	0	0	5	5	5	−5	0	10	70
		0,u^+	0	0	0	5	1	5	−1	0	10	30
6 545.1	1.123	1,*g*								1	10	<25
6 546.3	1.113	2,*u*	1	1	0	1	1	1	1	2	10	44
		2,*u*	0	2	0	1	−1	3	3	2	10	42
6 547.1	1.112	0,u^-	1	1	0	1	−1	1	1	2	10	66
		0,u^-	0	2	0	1	−1	3	1	2	10	34
6 548.6	1.133	0,g^-	0	0	0	6	−4	4	4	0	10	32
		0,g^-	0	0	0	6	−2	4	2	0	10	68
6 549.8	1.134	2,*u*	0	0	0	5	5	5	−3	0	10	35
		2,*u*	0	0	0	5	−1	5	3	0	10	30
6 554.4	1.113	2,*u*	1	1	0	1	1	1	1	2	10	49
		2,*u*	0	2	0	1	1	3	1	2	10	36
6 555.8	1.133	2,*g*	0	0	0	6	4	4	−2	0	10	27
		2,*g*	0	0	0	6	−2	4	4	0	10	41
6 567.7	1.121	1,*g*	1	0	0	3	1	2	0	1	10	40
		1,*g*	1	0	0	3	−1	2	2	1	10	31
6 577.6	1.134	0,u^-	0	0	0	5	−5	5	5	0	10	35
		0,u^-	0	0	0	5	−3	5	3	0	10	47
6 578.0	1.122	1,*g*	0	0	1	2	2	3	−1	1	10	34
		1,*g*	0	0	1	2	0	3	1	1	10	32
6 582.6	1.124	1,*g*	0	1	0	3	1	4	0	1	10	39
		1,*g*	0	1	0	3	−1	4	2	1	10	34
6 586.6	1.134	2,*u*	0	0	0	5	−3	5	5	0	10	44
6 588.0	1.135	0,g^+	0	0	0	4	2	6	−2	0	10	48
		0,g^+	0	0	0	4	0	6	0	0	10	29
6 594.2	1.122	1,*g*	0	0	1	2	2	3	−1	1	10	37
		1,*g*	0	0	1	2	−2	3	3	1	10	48
6 603.7	1.135	2,*g*	0	0	0	4	2	6	0	0	10	33
		2,*g*	0	0	0	4	0	6	2	0	10	26
6 604.4	1.125	1,*u*	0	1	0	2	2	5	−1	1	10	25
		1,*u*	0	1	0	2	0	5	1	1	10	35
6 605.5	1.133	0,g^+	0	0	0	6	2	4	−2	0	10	48
		0,g^+	0	0	0	6	0	4	0	0	10	46
6 611.5	1.112	0,u^+	0	1	1	0	0	2	0	2	10	98
6 613.4	1.133	2,*g*	0	0	0	6	2	4	0	0	10	35
		2,*g*	0	0	0	6	0	4	2	0	10	44
6 615.4	1.135	0,g^-	0	0	0	4	−4	6	4	0	10	68
		0,g^-	0	0	0	4	−2	6	2	0	10	32
6 618.4	1.122	1,*g*	0	0	1	2	0	3	1	1	10	60
6 622.7	1.134	0,u^+	0	0	0	5	3	5	−3	0	10	65
		0,u^+	0	0	0	5	1	5	−1	0	10	26
6 625.3	1.112	2,*u*	0	1	1	0	0	2	2	2	10	98
6 631.0	1.122	1,*u*	1	0	0	2	2	3	−1	1	10	34
		1,*u*	1	0	0	2	0	3	1	1	10	31
6 632.0	1.134	2,*u*	0	0	0	5	3	5	−1	0	10	34
		2,*u*	0	0	0	5	−1	5	3	0	10	25
		2,*u*	0	0	0	5	−3	5	5	0	10	28
6 633.0	1.135	2,*g*	0	0	0	4	4	6	−2	0	10	27
		2,*g*	0	0	0	4	−2	6	4	0	10	25

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		2,*g*	0	0	0	4	−4	6	6	0	10	39
6 634.6	1.124	1,*u*	0	1	0	2	2	5	−1	1	10	36
		1,*u*	0	1	0	2	−2	5	3	1	10	32
6 650.6	1.135	$0,g^+$	0	0	0	4	4	6	−4	0	10	71
6 652.3	1.123	1,*u*	1	0	0	2	2	3	−1	1	10	29
		1,*u*	1	0	0	2	−2	3	3	1	10	41
6 656.7	1.114	$0,g^+$	1	1	0	0	0	2	0	2	10	30
		$0,g^+$	0	2	0	0	0	4	0	2	10	62
6 664.0	1.135	2,*g*	0	0	0	4	4	6	−2	0	10	29
		2,*g*	0	0	0	4	−4	6	6	0	10	43
6 664.8	1.109	$0,g^+$	2	0	0	0	0	0	0	2	10	77
6 670.2	1.123	1,*u*	1	0	0	2	0	3	1	1	10	37
6 672.1	1.115	2,*g*	1	1	0	0	0	2	2	2	10	26
		2,*g*	0	2	0	0	0	4	2	2	10	74
6 678.2	1.112	$0,g^+$	1	1	0	0	0	2	0	2	10	69
6 679.4	1.134	$0,u^-$	0	0	0	5	−1	5	1	0	10	78
6 684.2	1.136	$0,u^+$	0	0	0	3	3	7	−3	0	10	33
		$0,u^+$	0	0	0	3	1	7	−1	0	10	67
6 685.5	1.124	1,*u*	0	1	0	2	0	5	1	1	10	40
6 688.5	1.134	2,*u*	0	0	0	5	1	5	1	0	10	44
		2,*u*	0	0	0	5	−1	5	3	0	10	33
6 689.8	1.113	2,*g*	1	1	0	0	0	2	2	2	10	74
		2,*g*	0	2	0	0	0	4	2	2	10	26
6 695.5	1.123	1,*u*	0	0	1	1	1	4	0	1	10	46
		1,*u*	0	0	1	1	−1	4	2	1	10	42
6 696.2	1.135	$0,g^-$	0	0	0	4	−4	6	4	0	10	32
		$0,g^-$	0	0	0	4	−2	6	2	0	10	68
6 699.9	1.136	2,*u*	0	0	0	3	1	7	1	0	10	37
		2,*u*	0	0	0	3	−1	7	3	0	10	30
6 707.4	1.135	2,*g*	0	0	0	4	2	6	0	0	10	30
		2,*g*	0	0	0	4	−2	6	4	0	10	39
6 721.3	1.123	1,*u*	0	0	1	1	1	4	0	1	10	48
		1,*u*	0	0	1	1	−1	4	2	1	10	49
6 722.2	1.136	$0,u^-$	0	0	0	3	−3	7	3	0	10	82
6 731.3	1.125	1,*g*	0	1	0	1	1	6	0	1	10	36
		1,*g*	0	1	0	1	−1	6	2	1	10	35
6 737.0	1.136	2,*u*	0	0	0	3	3	7	−1	0	10	36
		2,*u*	0	0	0	3	−3	7	5	0	10	45
6 753.1	1.135	$0,g^+$	0	0	0	4	2	6	−2	0	10	48
		$0,g^+$	0	0	0	4	0	6	0	0	10	46
6 755.1	1.123	1,*g*	1	0	0	1	1	4	0	1	10	36
		1,*g*	1	0	0	1	−1	4	2	1	10	35
6 763.1	1.113	1,*g*	0	2	0	5	1	0	0	2	11	99
6 763.4	1.135	2,*g*	0	0	0	4	2	6	0	0	10	28
		2,*g*	0	0	0	4	0	6	2	0	10	46
6 769.1	1.136	$0,u^+$	0	0	0	3	3	7	−3	0	10	67
		$0,u^+$	0	0	0	3	1	7	−1	0	10	33
6 770.8	1.124	1,*g*	1	0	0	1	−1	4	2	1	10	26
		1,*g*	0	1	0	1	−1	6	2	1	10	25
6 781.8	1.136	2,*u*	0	0	0	3	3	7	−1	0	10	31
		2,*u*	0	0	0	3	−3	7	5	0	10	35
6 789.1	1.124	1,*g*	1	0	0	1	−1	4	2	1	10	25
		1,*g*	0	1	0	1	1	6	0	1	10	26
6 792.7	1.137	$0,g^+$	0	0	0	2	2	8	−2	0	10	54
		$0,g^+$	0	0	0	2	0	8	0	0	10	46
6 807.3	1.122	$0,g^+$	0	1	0	8	0	0	0	1	11	97
6 807.6	1.137	2,*g*	0	0	0	2	2	8	0	0	10	30
		2,*g*	0	0	0	2	0	8	2	0	10	45
6 810.8	1.122	2,*g*	0	1	0	8	2	0	0	1	11	97
6 823.8	1.124	1,*g*	0	0	1	0	0	5	1	1	10	97
6 826.5	1.136	$0,u^-$	0	0	0	3	−1	7	1	0	10	82
6 829.3	1.104	$0,g^+$	0	3	0	2	0	0	0	3	11	100
6 833.0	1.104	2,*g*	0	3	0	2	2	0	0	3	11	100
6 837.9	1.136	2,*u*	0	0	0	3	1	7	1	0	10	43

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		2,*u*	0	0	0	3	−1	7	3	0	10	39
6 841.4	1.137	0,g^-	0	0	0	2	−2	8	2	0	10	100
6 853.4	1.114	1,*u*	0	2	0	4	2	1	−1	2	11	64
		1,*u*	0	2	0	4	0	1	1	2	11	34
6 854.8	1.123	0,u^+	0	1	0	7	1	1	−1	1	11	96
6 855.1	1.137	2,*g*	0	0	0	2	2	8	0	0	10	47
		2,*g*	0	0	0	2	−2	8	4	0	10	53
6 857.2	1.123	2,*u*	0	1	0	7	3	1	−1	1	11	67
		2,*u*	0	1	0	7	1	1	1	1	11	30
6 870.0	1.126	1,*u*	1	0	0	0	0	5	1	1	10	41
		1,*u*	0	1	0	0	0	7	1	1	10	59
6 885.6	1.114	1,*u*	0	2	0	4	2	1	−1	2	11	35
		1,*u*	0	2	0	4	0	1	1	2	11	65
6 892.4	1.125	1,*u*	1	0	0	0	0	5	1	1	10	59
		1,*u*	0	1	0	0	0	7	1	1	10	41
6 899.8	1.137	0,g^+	0	0	0	2	2	8	−2	0	10	46
		0,g^+	0	0	0	2	0	8	0	0	10	54
6 903.9	1.123	0,u^-	0	1	0	7	−1	1	1	1	11	98
6 908.6	1.123	2,*u*	0	1	0	7	3	1	−1	1	11	30
		2,*u*	0	1	0	7	1	1	1	1	11	67
6 912.1	1.137	2,*g*	0	0	0	2	0	8	2	0	10	55
6 913.2	1.138	0,u^+	0	0	0	1	1	9	−1	0	10	100
6 914.2	1.124	0,g^+	0	1	0	6	2	2	−2	1	11	53
		0,g^+	0	1	0	6	0	2	0	1	11	42
6 914.8	1.124	2,*g*	0	1	0	6	4	2	−2	1	11	55
		2,*g*	0	1	0	6	2	2	0	1	11	33
6 927.4	1.138	2,*u*	0	0	0	1	1	9	1	0	10	51
		2,*u*	0	0	0	1	−1	9	3	0	10	49
6 930.8	1.120	0,u^+	0	0	1	6	0	0	0	1	11	98
6 934.0	1.120	2,*u*	0	0	1	6	2	0	0	1	11	98
6 948.3	1.112	1,*u*	0	1	1	3	1	0	0	2	11	98
6 952.3	1.124	0,g^-	0	1	0	6	−2	2	2	1	11	97
6 955.5	1.115	1,*g*	0	2	0	3	3	2	−2	2	11	56
		1,*g*	0	2	0	3	1	2	0	2	11	31
6 956.1	1.124	2,*g*	0	1	0	6	4	2	−2	1	11	35
		2,*g*	0	1	0	6	0	2	2	1	11	43
6 963.7	1.105	0,u^+	0	3	0	1	1	1	−1	3	11	99
6 972.8	1.138	0,u^-	0	0	0	1	−1	9	1	0	10	100
6 973.1	1.131	1,*g*	0	0	0	11	1	0	0	0	11	100
6 975.6	1.120	0,g^+	1	0	0	6	0	0	0	1	11	65
		0,g^+	0	0	1	5	1	1	−1	1	11	30
6 976.4	1.105	0,u^-	0	3	0	1	−1	1	1	3	11	100
6 976.7	1.132	1,*u*	0	0	0	10	2	1	−1	0	11	58
		1,*u*	0	0	0	10	0	1	1	0	11	42
6 977.0	1.115	1,*g*	0	2	0	3	3	2	−2	2	11	35
		1,*g*	0	2	0	3	−1	2	2	2	11	48
6 978.9	1.120	2,*g*	1	0	0	6	2	0	0	1	11	64
6 983.7	1.105	2,*u*	0	3	0	1	1	1	1	3	11	100
6 983.8	1.125	2,*u*	0	1	0	5	5	3	−3	1	11	58
		2,*u*	0	1	0	5	3	3	−1	1	11	27
6 985.6	1.125	0,u^+	0	1	0	5	3	3	−3	1	11	33
		0,u^+	0	1	0	5	1	3	−1	1	11	60
6 985.9	1.138	2,*u*	0	0	0	1	1	9	1	0	10	49
		2,*u*	0	0	0	1	−1	9	3	0	10	51
6 992.2	1.133	1,*g*	0	0	0	9	3	2	−2	0	11	37
		1,*g*	0	0	0	9	1	2	0	0	11	44
6 999.4	1.123	0,g^+	0	1	0	6	2	2	−2	1	11	31
		0,g^+	0	1	0	6	0	2	0	1	11	50
7 001.0	1.112	1,*g*	1	1	0	3	1	0	0	2	11	77
7 002.7	1.121	2,*g*	1	0	0	6	2	0	0	1	11	26
		2,*g*	0	0	1	5	3	1	−1	1	11	51
7 003.4	1.121	0,g^+	1	0	0	6	0	0	0	1	11	28
		0,g^+	0	0	1	5	1	1	−1	1	11	53
7 006.5	1.123	2,*g*	0	1	0	6	2	2	0	1	11	39

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		2,*g*	0	1	0	6	0	2	2	1	11	40
7 009.0	1.114	1,*g*	0	2	0	3	1	2	0	2	11	49
		1,*g*	0	2	0	3	−1	2	2	2	11	28
7 013.1	1.125	0,u^-	0	1	0	5	−3	3	3	1	11	80
7 015.0	1.125	2,*u*	0	1	0	5	5	3	−3	1	11	30
		2,*u*	0	1	0	5	1	3	1	1	11	34
7 019.5	1.134	1,*u*	0	0	0	8	4	3	−3	0	11	28
		1,*u*	0	0	0	8	2	3	−1	0	11	38
		1,*u*	0	0	0	8	0	3	1	0	11	26
7 028.6	1.121	0,g^-	0	0	1	5	−1	1	1	1	11	98
7 034.3	1.121	2,*g*	0	0	1	5	1	1	1	1	11	76
7 038.2	1.121	0,u^+	1	0	0	5	1	1	−1	1	11	72
7 041.0	1.121	2,*u*	1	0	0	5	3	1	−1	1	11	57
7 042.8	1.132	1,*u*	0	0	0	10	2	1	−1	0	11	42
		1,*u*	0	0	0	10	0	1	1	0	11	58
7 045.7	1.139	0,g^+	0	0	0	0	0	10	0	0	10	100
7 047.6	1.133	1,*g*	0	0	0	9	3	2	−2	0	11	47
		1,*g*	0	0	0	9	−1	2	2	0	11	50
7 049.4	1.124	0,u^+	0	1	0	5	3	3	−3	1	11	54
		0,u^+	0	1	0	5	1	3	−1	1	11	38
7 052.4	1.112	1,*g*	0	1	1	2	2	1	−1	2	11	62
7 054.9	1.125	2,*u*	0	1	0	5	3	3	−1	1	11	42
		2,*u*	0	1	0	5	−1	3	3	1	11	44
7 058.8	1.135	1,*g*	0	0	0	7	5	4	−4	0	11	25
		1,*g*	0	0	0	7	3	4	−2	0	11	33
		1,*g*	0	0	0	7	1	4	0	0	11	26
7 059.3	1.139	2,*g*	0	0	0	0	0	10	2	0	10	100
7 064.4	1.134	1,*u*	0	0	0	8	4	3	−3	0	11	43
		1,*u*	0	0	0	8	−2	3	3	0	11	34
7 069.8	1.125	0,g^+	0	1	0	4	4	4	−4	1	11	26
		0,g^+	0	1	0	4	2	4	−2	1	11	41
7 072.7	1.122	2,*u*	0	0	1	4	4	2	−2	1	11	70
7 073.0	1.112	1,*g*	0	1	1	2	2	1	−1	2	11	34
		1,*g*	0	1	1	2	0	1	1	2	11	47
7 074.9	1.111	1,*g*	0	0	2	1	1	0	0	2	11	61
		1,*g*	0	1	1	2	0	1	1	2	11	31
7 075.6	1.121	0,u^-	1	0	0	5	−1	1	1	1	11	70
7 077.0	1.103	0,u^+	0	2	1	0	0	0	0	3	11	99
7 077.1	1.122	0,u^+	0	0	1	4	2	2	−2	1	11	45
		0,u^+	0	0	1	4	0	2	0	1	11	30
7 079.3	1.115	1,*u*	0	2	0	2	2	3	−1	2	11	34
		1,*u*	0	2	0	2	0	3	1	2	11	36
7 081.5	1.121	2,*u*	1	0	0	5	3	1	−1	1	11	31
		2,*u*	1	0	0	5	1	1	1	1	11	42
7 083.7	1.125	2,*g*	0	1	0	4	4	4	−2	1	11	37
		2,*g*	0	1	0	4	2	4	0	1	11	32
7 086.8	1.125	0,g^-	0	1	0	4	−4	4	4	1	11	71
7 093.4	1.135	1,*g*	0	0	0	7	5	4	−4	0	11	39
		1,*g*	0	0	0	7	−1	4	2	0	11	28
7 094.9	1.124	0,u^-	0	1	0	5	−1	3	1	1	11	68
7 097.6	1.114	1,*u*	0	2	0	2	−2	3	3	2	11	42
7 100.6	1.122	0,u^-	1	0	0	5	−1	1	1	1	11	26
		0,u^-	0	0	1	4	−2	2	2	1	11	50
7 101.7	1.112	1,*u*	1	0	1	1	1	0	0	2	11	51
7 101.7	1.123	2,*u*	0	1	0	5	1	3	1	1	11	33
7 105.3	1.123	2,*u*								1	11	<25
7 108.1	1.125	0,g^+	0	1	0	4	4	4	−4	1	11	61
7 110.4	1.135	1,*u*	0	0	0	6	6	5	−5	0	11	31
		1,*u*	0	0	0	6	4	5	−3	0	11	29
7 112.4	1.133	1,*g*	0	0	0	9	1	2	0	0	11	53
		1,*g*	0	0	0	9	−1	2	2	0	11	31
7 114.4	1.124	2,*g*	1	0	0	4	4	2	−2	1	11	28
7 115.2	1.111	1,*u*	1	0	1	1	1	0	0	2	11	27
		1,*u*	1	1	0	2	2	1	−1	2	11	49

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7 117.2	1.123	$0,g^+$	1	0	0	4	2	2	−2	1	11	39
		$0,g^+$	1	0	0	4	0	2	0	1	11	27
7 118.0	1.134	$1,u$	0	0	0	8	2	3	−1	0	11	28
		$1,u$	0	0	0	8	−2	3	3	0	11	42
7 118.6	1.123	$2,g$	1	0	0	4	4	2	−2	1	11	34
7 119.8	1.106	$0,g^+$	0	3	0	0	0	2	0	3	11	90
7 123.4	1.114	$1,u$	1	1	0	2	0	1	1	2	11	35
		$1,u$	0	2	0	2	0	3	1	2	11	27
7 126.2	1.122	$0,u^+$	0	0	1	4	2	2	−2	1	11	40
		$0,u^+$	0	0	1	4	0	2	0	1	11	58
7 134.3	1.122	$2,u$	0	0	1	4	2	2	0	1	11	37
		$2,u$	0	0	1	4	0	2	2	1	11	56
7 134.5	1.114	$1,u$	1	1	0	2	0	1	1	2	11	35
		$1,u$	0	2	0	2	0	3	1	2	11	32
7 134.6	1.135	$1,u$	0	0	0	6	6	5	−5	0	11	39
7 135.3	1.106	$2,g$	0	3	0	0	0	2	2	3	11	100
7 135.8	1.135	$1,g$	0	0	0	7	5	4	−4	0	11	26
		$1,g$	0	0	0	7	−3	4	4	0	11	40
7 137.8	1.123	$0,g^-$	1	0	0	4	−2	2	2	1	11	56
7 137.8	1.102	$0,g^+$	1	2	0	0	0	0	0	3	11	90
7 144.5	1.122	$2,g$	1	0	0	4	0	2	2	1	11	25
7 147.8	1.124	$0,g^-$	1	0	0	4	−2	2	2	1	11	27
		$0,g^-$	0	1	0	4	−2	4	2	1	11	55
7 154.5	1.125	$2,g$	0	1	0	4	2	4	0	1	11	29
		$2,g$	0	1	0	4	−2	4	4	1	11	30
7 162.1	1.123	$0,g^+$	0	0	1	3	3	3	−3	1	11	42
		$0,g^+$	0	0	1	3	1	3	−1	1	11	42
7 166.0	1.135	$1,u$	0	0	0	6	−4	5	5	0	11	35
7 172.9	1.126	$0,u^+$	0	1	0	3	3	5	−3	1	11	30
		$0,u^+$	0	1	0	3	1	5	−1	1	11	55
7 173.9	1.123	$0,g^-$	0	0	1	3	−3	3	3	1	11	74
7 174.9	1.122	$0,g^+$	1	0	0	4	2	2	−2	1	11	34
		$0,g^+$	1	0	0	4	0	2	0	1	11	38
7 177.1	1.123	$2,g$	0	0	1	3	3	3	−1	1	11	56
7 179.8	1.113	$1,u$	0	1	1	1	1	2	0	2	11	40
		$1,u$	0	1	1	1	−1	2	2	2	11	42
7 181.7	1.134	$1,u$	0	0	0	8	2	3	−1	0	11	33
		$1,u$	0	0	0	8	0	3	1	0	11	47
7 182.9	1.122	$2,g$	1	0	0	4	2	2	0	1	11	44
		$2,g$	1	0	0	4	0	2	2	1	11	28
7 184.3	1.136	$1,g$	0	0	0	5	3	6	−2	0	11	26
		$1,g$	0	0	0	5	1	6	0	0	11	26
7 188.0	1.135	$1,g$	0	0	0	7	3	4	−2	0	11	35
		$1,g$	0	0	0	7	−3	4	4	0	11	28
7 189.4	1.126	$2,u$	0	1	0	3	3	5	−1	1	11	25
		$2,u$	0	1	0	3	1	5	1	1	11	32
7 190.5	1.125	$0,g^+$	0	1	0	4	2	4	−2	1	11	27
		$0,g^+$	0	1	0	4	0	4	0	1	11	39
7 197.1	1.123	$0,g^+$								1	11	<25
7 197.5	1.113	$1,u$	0	1	1	1	1	2	0	2	11	57
		$1,u$	0	1	1	1	−1	2	2	2	11	36
7 199.6	1.126	$0,u^-$	0	1	0	3	−3	5	3	1	11	69
7 199.9	1.125	$2,g$	0	1	0	4	2	4	0	1	11	26
		$2,g$	0	1	0	4	0	4	2	1	11	41
7 203.7	1.111	$1,u$	0	0	2	0	0	1	1	2	11	72
7 205.2	1.123	$2,g$	0	0	1	3	−1	3	3	1	11	26
7 206.3	1.135	$1,u$	0	0	0	6	4	5	−3	0	11	31
		$1,u$	0	0	0	6	−4	5	5	0	11	35
7 207.2	1.123	$0,u^+$	1	0	0	3	3	3	−3	1	11	35
		$0,u^+$	1	0	0	3	1	3	−1	1	11	48
7 209.4	1.136	$1,g$	0	0	0	5	5	6	−4	0	11	26
		$1,g$	0	0	0	5	−5	6	6	0	11	30
7 214.1	1.116	$1,g$	0	2	0	1	1	4	0	2	11	39
		$1,g$	0	2	0	1	−1	4	2	2	11	36

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7 216.0	1.126	2,u	0	1	0	3	−3	5	5	1	11	44
7 223.7	1.123	0,u^-	1	0	0	3	−3	3	3	1	11	73
7 223.7	1.123	0,g^-	0	0	1	3	−1	3	1	1	11	87
7 224.3	1.124	2,u	1	0	0	3	3	3	−1	1	11	30
		2,u	1	0	0	3	1	3	1	1	11	26
7 227.7	1.111	1,g	1	0	1	0	0	1	1	2	11	57
7 232.8	1.125	0,u^+	0	1	0	3	3	5	−3	1	11	41
7 233.8	1.123	2,g	0	0	1	3	1	3	1	1	11	50
		2,g	0	0	1	3	−1	3	3	1	11	36
7 237.0	1.136	1,g	0	0	0	5	5	6	−4	0	11	29
		1,g	0	0	0	5	−5	6	6	0	11	43
7 242.6	1.114	1,g	0	2	0	1	1	4	0	2	11	26
7 244.2	1.112	1,g	1	1	0	1	1	2	0	2	11	37
		1,g	1	1	0	1	−1	2	2	2	11	30
7 244.7	1.125	2,u	0	1	0	3	−3	5	5	1	11	28
7 247.9	1.110	1,g	2	0	0	1	1	0	0	2	11	48
		1,g	1	0	1	0	0	1	1	2	11	26
7 248.4	1.124	0,u^+	1	0	0	3	3	3	−3	1	11	38
7 250.9	1.135	1,g	0	0	0	7	1	4	0	0	11	43
		1,g	0	0	0	7	−1	4	2	0	11	34
7 256.2	1.125	2,u	1	0	0	3	−1	3	3	1	11	26
7 257.4	1.135	1,u	0	0	0	6	2	5	−1	0	11	26
		1,u	0	0	0	6	−2	5	3	0	11	35
7 261.4	1.114	1,g	1	1	0	1	1	2	0	2	11	33
		1,g	1	1	0	1	−1	2	2	2	11	32
7 268.5	1.124	0,u^+	0	0	1	2	2	4	−2	1	11	52
		0,u^+	0	0	1	2	0	4	0	1	11	33
7 269.1	1.137	1,u	0	0	0	4	2	7	−1	0	11	28
		1,u	0	0	0	4	0	7	1	0	11	30
7 272.6	1.123	0,u^-	1	0	0	3	−1	3	1	1	11	58
7 275.6	1.136	1,g								0	11	<25
7 282.1	1.123	2,u	1	0	0	3	−1	3	3	1	11	29
7 284.7	1.124	2,u	0	0	1	2	2	4	0	1	11	25
7 286.9	1.125	0,u^-	0	0	1	2	−2	4	2	1	11	47
		0,u^-	0	1	0	3	−1	5	1	1	11	46
7 288.7	1.127	0,g^+	0	1	0	2	2	6	−2	1	11	43
		0,g^+	0	1	0	2	0	6	0	1	11	35
7 293.2	1.124	0,u^-	1	0	0	3	−1	3	1	1	11	28
		0,u^-	0	0	1	2	−2	4	2	1	11	41
7 298.3	1.126	2,u	0	1	0	3	1	5	1	1	11	38
		2,u	0	1	0	3	−1	5	3	1	11	27
7 302.7	1.137	1,u	0	0	0	4	4	7	−3	0	11	31
		1,u	0	0	0	4	−4	7	5	0	11	34
7 304.6	1.127	2,g	0	1	0	2	2	6	0	1	11	26
		2,g	0	1	0	2	0	6	2	1	11	35
7 305.2	1.124	2,u	0	0	1	2	2	4	0	1	11	33
		2,u	0	0	1	2	−2	4	4	1	11	41
7 319.1	1.124	0,g^+	1	0	0	2	2	4	−2	1	11	45
		0,g^+	1	0	0	2	0	4	0	1	11	33
7 319.8	1.135	1,u	0	0	0	6	2	5	−1	0	11	28
		1,u	0	0	0	6	0	5	1	0	11	44
7 320.9	1.124	0,u^+	0	0	1	2	2	4	−2	1	11	40
		0,u^+	0	0	1	2	0	4	0	1	11	58
7 321.2	1.114	1,g	0	1	1	0	0	3	1	2	11	98
7 325.3	1.126	0,g^-	1	0	0	2	−2	4	2	1	11	30
		0,g^-	0	1	0	2	−2	6	2	1	11	67
7 326.3	1.136	1,g	0	0	0	5	3	6	−2	0	11	32
		1,g	0	0	0	5	−3	6	4	0	11	32
7 332.8	1.124	2,u	0	0	1	2	0	4	2	1	11	57
7 334.5	1.124	2,g	1	0	0	2	2	4	0	1	11	34
		2,g	1	0	0	2	0	4	2	1	11	31
7 340.0	1.126	2,g	0	1	0	2	2	6	0	1	11	35
		2,g	0	1	0	2	−2	6	4	1	11	33
7 343.4	1.137	1,u	0	0	0	4	4	7	−3	0	11	33

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		1,u	0	0	0	4	−4	7	5	0	11	39
7 347.5	1.125	0,g^-	1	0	0	2	−2	4	2	1	11	68
		0,g^-	0	1	0	2	−2	6	2	1	11	31
7 360.4	1.124	2,g	1	0	0	2	2	4	0	1	11	26
		2,g	1	0	0	2	−2	4	4	1	11	44
7 361.1	1.116	1,u	1	1	0	0	0	3	1	2	11	32
		1,u	0	2	0	0	0	5	1	2	11	61
7 365.9	1.138	1,g	0	0	0	3	1	8	0	0	11	35
		1,g	0	0	0	3	−1	8	2	0	11	32
7 368.6	1.125	0,g^+	1	0	0	2	2	4	−2	1	11	27
		0,g^+	1	0	0	2	0	4	0	1	11	31
7 370.7	1.114	0,g^+	0	2	0	6	0	0	0	2	12	98
7 373.1	1.111	1,u	2	0	0	0	0	1	1	2	11	73
7 374.4	1.114	2,g	0	2	0	6	2	0	0	2	12	98
7 380.5	1.125	2,g	1	0	0	2	0	4	2	1	11	34
7 384.3	1.125	0,g^+	0	0	1	1	1	5	−1	1	11	65
7 388.0	1.114	1,u	1	1	0	0	0	3	1	2	11	65
7 388.6	1.136	1,g	0	0	0	5	1	6	0	0	11	40
		1,g	0	0	0	5	−1	6	2	0	11	36
7 388.9	1.125	0,g^+	1	0	0	2	0	4	0	1	11	27
		0,g^+	0	0	1	1	1	5	−1	1	11	27
7 394.6	1.137	1,u	0	0	0	4	2	7	−1	0	11	31
		1,u	0	0	0	4	−2	7	3	0	11	34
7 397.0	1.126	2,g	0	1	0	2	0	6	2	1	11	34
7 401.6	1.125	2,g	0	0	1	1	1	5	1	1	11	41
		2,g	0	0	1	1	−1	5	3	1	11	29
7 409.2	1.105	1,g	0	3	0	3	1	0	0	3	12	100
7 409.7	1.138	1,g	0	0	0	3	3	8	−2	0	11	39
		1,g	0	0	0	3	−3	8	4	0	11	42
7 416.7	1.127	0,u^+	1	0	0	1	1	5	−1	1	11	27
		0,u^+	0	1	0	1	1	7	−1	1	11	70
7 417.9	1.125	0,g^-	0	0	1	1	−1	5	1	1	11	97
7 431.0	1.125	2,g	0	0	1	1	1	5	1	1	11	46
		2,g	0	0	1	1	−1	5	3	1	11	49
7 431.7	1.127	2,u	0	1	0	1	1	7	1	1	11	36
		2,u	0	1	0	1	−1	7	3	1	11	35
7 444.4	1.125	0,u^+	1	0	0	1	1	5	−1	1	11	70
		0,u^+	0	1	0	1	1	7	−1	1	11	29
7 446.7	1.123	1,g	0	1	0	9	1	0	0	1	12	96
7 450.3	1.115	0,u^+	0	2	0	5	1	1	−1	2	12	97
7 452.6	1.115	2,u	0	2	0	5	3	1	−1	2	12	72
7 457.1	1.137	1,u	0	0	0	4	2	7	−1	0	11	26
		1,u	0	0	0	4	0	7	1	0	11	45
7 458.6	1.125	2,u	1	0	0	1	1	5	1	1	11	37
		2,u	1	0	0	1	−1	5	3	1	11	35
7 462.2	1.138	1,g	0	0	0	3	3	8	−2	0	11	33
		1,g	0	0	0	3	−3	8	4	0	11	35
7 463.0	1.126	0,u^-	1	0	0	1	−1	5	1	1	11	47
		0,u^-	0	1	0	1	−1	7	1	1	11	52
7 474.8	1.139	1,u	0	0	0	2	2	9	−1	0	11	28
		1,u	0	0	0	2	0	9	1	0	11	46
		1,u	0	0	0	2	−2	9	3	0	11	26
7 476.3	1.126	2,u	1	0	0	1	−1	5	3	1	11	26
		2,u	0	1	0	1	1	7	1	1	11	25
		2,u	0	1	0	1	−1	7	3	1	11	27
7 483.0	1.124	1,u	0	1	0	8	2	1	−1	1	12	56
		1,u	0	1	0	8	0	1	1	1	12	39
7 485.0	1.126	0,u^-	1	0	0	1	−1	5	1	1	11	52
		0,u^-	0	1	0	1	−1	7	1	1	11	48
7 487.8	1.115	0,u^-	0	2	0	5	−1	1	1	2	12	99
7 493.0	1.115	2,u	0	2	0	5	3	1	−1	2	12	26
		2,u	0	2	0	5	1	1	1	2	12	73
7 497.1	1.126	2,u	1	0	0	1	−1	5	3	1	11	27
7 514.8	1.126	0,u^+	0	0	1	0	0	6	0	1	11	96

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7 525.3	1.138	1,g	0	0	0	3	1	8	0	0	11	41
		1,g	0	0	0	3	−1	8	2	0	11	40
7 528.6	1.126	2,u	0	0	1	0	0	6	2	1	11	96
7 529.3	1.139	1,u	0	0	0	2	2	9	−1	0	11	49
		1,u	0	0	0	2	−2	9	3	0	11	51
7 531.0	1.125	1,g	0	1	0	7	3	2	−2	1	12	37
		1,g	0	1	0	7	1	2	0	1	12	40
7 531.6	1.106	1,u	0	3	0	2	2	1	−1	3	12	73
		1,u	0	3	0	2	0	1	1	3	12	26
7 538.6	1.124	1,u	0	1	0	8	2	1	−1	1	12	40
		1,u	0	1	0	8	0	1	1	1	12	57
7 541.9	1.116	2,g	0	2	0	4	4	2	−2	2	12	68
7 541.9	1.116	0,g^+	0	2	0	4	2	2	−2	2	12	55
		0,g^+	0	2	0	4	0	2	0	2	12	41
7 546.5	1.113	0,u^+	0	1	1	4	0	0	0	2	12	97
7 550.1	1.113	2,u	0	1	1	4	2	0	0	2	12	97
7 552.1	1.106	1,u	0	3	0	2	2	1	−1	3	12	26
		1,u	0	3	0	2	0	1	1	3	12	74
7 556.1	1.096	0,g^+	0	4	0	0	0	0	0	4	12	100
7 556.6	1.128	0,g^+	1	0	0	0	0	6	0	1	11	40
		0,g^+	0	1	0	0	0	8	0	1	11	60
7 561.6	1.122	1,u	0	0	1	7	1	0	0	1	12	98
7 568.4	1.116	0,g^-	0	2	0	4	−2	2	2	2	12	98
7 570.7	1.128	2,g	1	0	0	0	0	6	2	1	11	39
		2,g	0	1	0	0	0	8	2	1	11	61
7 572.3	1.116	2,g	0	2	0	4	4	2	−2	2	12	26
		2,g	0	2	0	4	2	2	0	2	12	31
		2,g	0	2	0	4	0	2	2	2	12	39
7 575.8	1.125	1,g	0	1	0	7	3	2	−2	1	12	44
		1,g	0	1	0	7	−1	2	2	1	12	48
7 582.5	1.127	0,g^+	1	0	0	0	0	6	0	1	11	60
		0,g^+	0	1	0	0	0	8	0	1	11	40
7 590.6	1.126	1,u	0	1	0	6	4	3	−3	1	12	30
		1,u	0	1	0	6	2	3	−1	1	12	35
7 593.3	1.139	1,u	0	0	0	2	0	9	1	0	11	54
7 595.7	1.112	0,g^+	1	1	0	4	0	0	0	2	12	79
7 595.8	1.127	2,g	1	0	0	0	0	6	2	1	11	61
		2,g	0	1	0	0	0	8	2	1	11	39
7 595.8	1.140	1,g	0	0	0	1	1	10	0	0	11	50
		1,g	0	0	0	1	−1	10	2	0	11	50
7 600.0	1.122	1,g	1	0	0	7	1	0	0	1	12	47
		1,g	0	0	1	6	2	1	−1	1	12	27
7 600.1	1.112	2,g	1	1	0	4	2	0	0	2	12	85
7 605.4	1.115	0,g^+	0	2	0	4	2	2	−2	2	12	33
		0,g^+	0	2	0	4	0	2	0	2	12	55
7 611.8	1.116	2,g	0	2	0	4	2	2	0	2	12	44
		2,g	0	2	0	4	0	2	2	2	12	47
7 625.0	1.126	1,u	0	1	0	6	4	3	−3	1	12	41
		1,u	0	1	0	6	−2	3	3	1	12	31
7 626.0	1.122	1,g	1	0	0	7	1	0	0	1	12	39
		1,g	0	0	1	6	2	1	−1	1	12	30
7 630.7	1.124	1,g	0	1	0	7	1	2	0	1	12	42
		1,g	0	1	0	7	−1	2	2	1	12	27
7 635.7	1.133	0,u^+	0	0	0	11	1	1	−1	0	12	100
7 638.0	1.133	2,u	0	0	0	11	3	1	−1	0	12	64
		2,u	0	0	0	11	1	1	1	0	12	36
7 640.3	1.134	0,g^+	0	0	0	10	2	2	−2	0	12	54
		0,g^+	0	0	0	10	0	2	0	0	12	46
7 641.2	1.113	0,g^+	0	1	1	3	1	1	−1	2	12	73
7 641.4	1.134	2,g	0	0	0	10	4	2	−2	0	12	45
		2,g	0	0	0	10	2	2	0	0	12	42
7 641.9	1.113	2,g	0	1	1	3	3	1	−1	2	12	68
7 643.1	1.132	0,g^+	0	0	0	12	0	0	0	0	12	100
7 646.0	1.117	0,u^+	0	2	0	3	3	3	−3	2	12	38

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,u^+$	0	2	0	3	1	3	−1	2	12	55
7 646.3	1.132	$2,g$	0	0	0	12	2	0	0	0	12	100
7 647.4	1.104	$1,u$	0	2	1	1	1	0	0	3	12	99
7 652.1	1.122	$1,u$	1	0	0	6	2	1	−1	1	12	39
7 654.8	1.122	$1,g$	0	0	1	6	2	1	−1	1	12	35
		$1,g$	0	0	1	6	0	1	1	1	12	62
7 656.3	1.135	$2,u$	0	0	0	9	5	3	−3	0	12	38
		$2,u$	0	0	0	9	3	3	−1	0	12	39
7 656.8	1.135	$0,u^+$	0	0	0	9	3	3	−3	0	12	31
		$0,u^+$	0	0	0	9	1	3	−1	0	12	69
7 661.1	1.140	$1,g$	0	0	0	1	1	10	0	0	11	50
		$1,g$	0	0	0	1	−1	10	2	0	11	50
7 661.7	1.117	$0,u^-$	0	2	0	3	−3	3	3	2	12	85
7 661.9	1.116	$2,u$	0	2	0	3	3	3	−1	2	12	48
		$2,u$	0	2	0	3	1	3	1	2	12	32
7 662.5	1.126	$1,g$	0	1	0	5	5	4	−4	1	12	32
		$1,g$	0	1	0	5	3	4	−2	1	12	29
7 663.4	1.111	$0,g^+$	0	0	2	2	0	0	0	2	12	72
7 665.5	1.114	$0,g^-$	0	1	1	3	−1	1	1	2	12	98
7 665.9	1.111	$2,g$	0	0	2	2	2	0	0	2	12	72
7 668.0	1.126	$1,u$	0	1	0	6	2	3	−1	1	12	32
		$1,u$	0	1	0	6	−2	3	3	1	12	39
7 672.1	1.113	$2,g$	0	1	1	3	1	1	1	2	12	85
7 675.6	1.107	$1,g$	0	3	0	1	1	2	0	3	12	51
		$1,g$	0	3	0	1	−1	2	2	3	12	45
7 680.6	1.113	$0,u^+$	1	0	1	2	0	0	0	2	12	31
		$0,u^+$	1	1	0	3	1	1	−1	2	12	29
		$0,u^+$	0	2	0	3	3	3	−3	2	12	29
7 682.7	1.136	$2,g$	0	0	0	8	6	4	−4	0	12	37
		$2,g$	0	0	0	8	4	4	−2	0	12	35
7 685.4	1.136	$0,g^+$	0	0	0	8	2	4	−2	0	12	49
		$0,g^+$	0	0	0	8	0	4	0	0	12	31
7 685.9	1.112	$2,u$	1	0	1	2	2	0	0	2	12	53
		$2,u$	1	1	0	3	3	1	−1	2	12	29
7 686.2	1.126	$1,g$	0	1	0	5	5	4	−4	1	12	39
7 686.4	1.114	$0,u^+$	1	0	1	2	0	0	0	2	12	33
		$0,u^+$	0	2	0	3	3	3	−3	2	12	29
		$0,u^+$	0	2	0	3	1	3	−1	2	12	31
7 687.7	1.123	$1,u$	0	0	1	5	3	2	−2	1	12	43
7 692.3	1.116	$2,u$	0	2	0	3	3	3	−1	2	12	34
		$2,u$	0	2	0	3	−1	3	3	2	12	43
7 693.0	1.107	$1,g$	0	3	0	1	1	2	0	3	12	37
		$1,g$	0	3	0	1	−1	2	2	3	12	53
7 695.8	1.122	$1,u$	1	0	0	6	2	1	−1	1	12	31
		$1,u$	0	0	1	5	−1	2	2	1	12	27
7 700.8	1.112	$0,u^+$	1	0	1	2	0	0	0	2	12	33
		$0,u^+$	1	1	0	3	1	1	−1	2	12	58
7 701.0	1.134	$0,g^-$	0	0	0	10	−2	2	2	0	12	100
7 702.7	1.112	$2,u$	1	0	1	2	2	0	0	2	12	34
		$2,u$	1	1	0	3	3	1	−1	2	12	48
7 704.4	1.134	$2,g$	0	0	0	10	4	2	−2	0	12	43
		$2,g$	0	0	0	10	0	2	2	0	12	48
7 704.9	1.103	$1,g$	1	2	0	1	1	0	0	3	12	86
7 706.7	1.135	$0,u^-$	0	0	0	9	−3	3	3	0	12	81
7 707.3	1.133	$0,u^-$	0	0	0	11	−1	1	1	0	12	100
7 709.2	1.135	$2,u$	0	0	0	9	5	3	−3	0	12	41
		$2,u$	0	0	0	9	1	3	1	0	12	31
		$2,u$	0	0	0	9	−1	3	3	0	12	27
7 711.4	1.133	$2,u$	0	0	0	11	3	1	−1	0	12	36
		$2,u$	0	0	0	11	1	1	1	0	12	64
7 713.1	1.114	$0,u^-$	1	1	0	3	−1	1	1	2	12	57
		$0,u^-$	0	2	0	3	−1	3	1	2	12	32
7 715.0	1.125	$1,g$	0	1	0	5	−3	4	4	1	12	26
7 716.7	1.123	$1,u$								1	12	<25

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7 720.5	1.125	1,*g*								1	12	<25
7 720.8	1.136	2,*u*	0	0	0	7	7	5	−5	0	12	48
		2,*u*	0	0	0	7	5	5	−3	0	12	29
7 721.1	1.114	2,*u*	1	1	0	3	1	1	1	2	12	57
7 722.9	1.125	1,*u*	0	1	0	6	0	3	1	1	12	31
7 724.7	1.115	0,u^-	1	1	0	3	−1	1	1	2	12	37
		0,u^-	0	2	0	3	−1	3	1	2	12	56
7 724.8	1.136	0,g^-	0	0	0	8	−4	4	4	0	12	64
		0,g^-	0	0	0	8	−2	4	2	0	12	36
7 725.9	1.136	2,*g*	0	0	0	8	6	4	−4	0	12	38
		2,*g*	0	0	0	8	0	4	2	0	12	29
7 726.4	1.136	0,u^+	0	0	0	7	3	5	−3	0	12	35
		0,u^+	0	0	0	7	1	5	−1	0	12	49
7 728.7	1.141	1,*u*	0	0	0	0	0	11	1	0	11	100
7 731.7	1.116	2,*u*	0	2	0	3	1	3	1	2	12	45
7 747.4	1.114	0,u^+	0	1	1	2	2	2	−2	2	12	48
7 747.7	1.123	1,*u*	0	0	1	5	1	2	0	1	12	51
		1,*u*	0	0	1	5	−1	2	2	1	12	36
7 748.6	1.123	1,*g*	1	0	0	5	3	2	−2	1	12	26
		1,*g*	1	0	0	5	−1	2	2	1	12	31
7 753.9	1.136	2,*u*	0	0	0	7	7	5	−5	0	12	34
		2,*u*	0	0	0	7	1	5	1	0	12	26
7 755.6	1.136	0,u^-	0	0	0	7	−5	5	5	0	12	54
		0,u^-	0	0	0	7	−3	5	3	0	12	40
7 755.7	1.127	1,*u*	0	1	0	4	2	5	−1	1	12	27
7 758.7	1.125	1,*g*	0	0	1	4	4	3	−3	1	12	41
7 759.9	1.114	0,u^-	0	1	1	2	−2	2	2	2	12	77
7 760.9	1.125	1,*g*								1	12	<25
7 765.8	1.135	0,u^+	0	0	0	9	3	3	−3	0	12	69
		0,u^+	0	0	0	9	1	3	−1	0	12	31
7 766.6	1.114	2,*u*	0	1	1	2	2	2	0	2	12	57
7 769.4	1.117	0,g^+	0	2	0	2	2	4	−2	2	12	47
		0,g^+	0	2	0	2	0	4	0	2	12	35
7 770.5	1.135	2,*u*	0	0	0	9	3	3	−1	0	12	35
		2,*u*	0	0	0	9	−1	3	3	0	12	46
7 771.3	1.134	0,g^+	0	0	0	10	2	2	−2	0	12	46
		0,g^+	0	0	0	10	0	2	0	0	12	54
7 772.4	1.136	0,g^+	0	0	0	8	4	4	−4	0	12	73
7 774.9	1.112	0,u^+	0	0	2	1	1	1	−1	2	12	69
7 776.4	1.134	2,*g*	0	0	0	10	2	2	0	0	12	49
		2,*g*	0	0	0	10	0	2	2	0	12	39
7 776.7	1.136	2,*g*	0	0	0	8	−2	4	4	0	12	37
7 779.8	1.127	1,*u*	0	1	0	4	−4	5	5	1	12	35
7 780.5	1.137	0,g^+	0	0	0	6	4	6	−4	0	12	27
		0,g^+	0	0	0	6	2	6	−2	0	12	38
7 780.9	1.124	1,*g*								1	12	<25
7 784.1	1.114	0,u^+	0	1	1	2	2	2	−2	2	12	37
		0,u^+	0	1	1	2	0	2	0	2	12	61
7 784.3	1.112	0,u^-	0	0	2	1	−1	1	1	2	12	74
7 786.5	1.117	2,*g*	0	2	0	2	2	4	0	2	12	34
		2,*g*	0	2	0	2	0	4	2	2	12	35
7 790.1	1.112	0,g^+	1	0	1	1	1	1	−1	2	12	60
7 790.6	1.113	2,*u*	0	0	2	1	1	1	1	2	12	52
		2,*u*	0	1	1	2	2	2	0	2	12	31
7 790.8	1.123	1,*g*	1	0	0	5	1	2	0	1	12	32
7 790.9	1.137	2,*g*	0	0	0	6	6	6	−4	0	12	28
		2,*g*	0	0	0	6	4	6	−2	0	12	32
7 791.3	1.136	0,u^+	0	0	0	7	5	5	−5	0	12	70
		0,u^+	0	0	0	7	1	5	−1	0	12	29
7 793.7	1.105	1,*g*	0	2	1	0	0	1	1	3	12	99
7 794.7	1.117	0,g^-	0	2	0	2	−2	4	2	2	12	72
7 794.8	1.114	2,*u*	0	1	1	2	0	2	2	2	12	63
7 795.2	1.136	2,*u*	0	0	0	7	−1	5	3	0	12	26
7 797.4	1.124	1,*u*	1	0	0	4	4	3	−3	1	12	32

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		1,u	1	0	0	4	2	3	−1	1	12	27
7 800.1	1.137	0,g^-	0	0	0	6	−6	6	6	0	12	53
		0,g^-	0	0	0	6	−4	6	4	0	12	35
7 806.5	1.127	1,u	0	1	0	4	−4	5	5	1	12	38
7 806.6	1.113	2,g	1	0	1	1	1	1	1	2	12	39
7 807.1	1.125	1,g								1	12	<25
7 808.7	1.113	0,g^-	1	0	1	1	−1	1	1	2	12	65
7 810.8	1.113	0,g^+	1	1	0	2	2	2	−2	2	12	43
7 812.5	1.116	2,g	0	2	0	2	2	4	0	2	12	33
		2,g	0	2	0	2	−2	4	4	2	12	42
7 815.0	1.125	1,g	0	1	0	5	1	4	0	1	12	25
7 821.0	1.124	1,u	1	0	0	4	4	3	−3	1	12	32
7 822.6	1.137	0,g^+	0	0	0	6	6	6	−6	0	12	70
7 823.7	1.113	0,g^-	1	0	1	1	−1	1	1	2	12	30
		0,g^-	1	1	0	2	−2	2	2	2	12	62
7 826.0	1.137	2,g	0	0	0	6	6	6	−4	0	12	34
7 826.7	1.114	0,g^+	2	0	0	2	0	0	0	2	12	26
7 827.2	1.113	2,g	1	1	0	2	2	2	0	2	12	39
7 830.1	1.136	0,g^-	0	0	0	8	−4	4	4	0	12	36
		0,g^-	0	0	0	8	−2	4	2	0	12	64
7 830.8	1.112	0,g^+	2	0	0	2	0	0	0	2	12	51
7 831.5	1.107	1,u	0	3	0	0	0	3	1	3	12	85
7 834.4	1.111	2,g	2	0	0	2	2	0	0	2	12	49
		2,g	1	0	1	1	1	1	1	2	12	27
7 835.1	1.135	0,u^-	0	0	0	9	−1	3	1	0	12	81
7 836.3	1.136	2,g	0	0	0	8	4	4	−2	0	12	31
		2,g	0	0	0	8	−2	4	4	0	12	37
7 837.1	1.136	0,u^-	0	0	0	7	−5	5	5	0	12	44
		0,u^-	0	0	0	7	−3	5	3	0	12	36
7 840.2	1.115	2,g	1	1	0	2	0	2	2	2	12	26
		2,g	0	2	0	2	0	4	2	2	12	27
7 840.3	1.124	1,g	0	0	1	4	2	3	−1	1	12	26
		1,g	0	0	1	4	0	3	1	1	12	52
7 841.2	1.135	2,u	0	0	0	9	3	3	−1	0	12	26
		2,u	0	0	0	9	1	3	1	0	12	49
7 842.0	1.125	1,u								1	12	<25
7 843.8	1.136	2,u	0	0	0	7	5	5	−3	0	12	29
		2,u	0	0	0	7	−3	5	5	0	12	40
7 845.3	1.115	0,g^+	1	1	0	2	0	2	0	2	12	34
		0,g^+	0	2	0	2	0	4	0	2	12	25
7 852.6	1.138	0,u^+	0	0	0	5	3	7	−3	0	12	35
		0,u^+	0	0	0	5	1	7	−1	0	12	49
7 853.5	1.104	1,u	1	2	0	0	0	1	1	3	12	85
7 853.6	1.116	2,g	1	1	0	2	0	2	2	2	12	33
		2,g	0	2	0	2	0	4	2	2	12	29
7 853.8	1.126	1,u								1	12	<25
7 855.7	1.137	0,g^-	0	0	0	6	−6	6	6	0	12	43
		0,g^-	0	0	0	6	−2	6	2	0	12	33
7 856.6	1.125	1,u								1	12	<25
7 860.1	1.128	1,g	0	1	0	3	1	6	0	1	12	29
7 864.4	1.137	2,g	0	0	0	6	−4	6	6	0	12	37
7 867.7	1.138	2,u	0	0	0	5	3	7	−1	0	12	29
		2,u	0	0	0	5	1	7	1	0	12	27
7 873.7	1.125	1,u	0	0	1	3	3	4	−2	1	12	30
		1,u	0	0	1	3	−3	4	4	1	12	35
7 877.3	1.115	0,g^+	0	1	1	1	1	3	−1	2	12	82
7 881.8	1.138	0,u^-	0	0	0	5	−5	7	5	0	12	54
		0,u^-	0	0	0	5	−3	7	3	0	12	40
7 884.8	1.124	1,u	1	0	0	4	0	3	1	1	12	27
7 892.4	1.115	2,g	0	1	1	1	1	3	1	2	12	39
		2,g	0	1	1	1	−1	3	3	2	12	42
7 892.6	1.128	1,g	0	1	0	3	3	6	−2	1	12	25
		1,g	0	1	0	3	−3	6	4	1	12	37
7 894.0	1.136	0,u^+	0	0	0	7	3	5	−3	0	12	64

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7 897.5	1.126	1,u								1	12	<25
7 897.7	1.125	1,g								1	12	<25
7 898.7	1.136	0,g^+	0	0	0	8	2	4	−2	0	12	49
		0,g^+	0	0	0	8	0	4	0	0	12	44
7 900.7	1.137	0,g^+	0	0	0	6	4	6	−4	0	12	62
7 900.8	1.138	2,u	0	0	0	5	−3	7	5	0	12	27
		2,u	0	0	0	5	−5	7	7	0	12	25
7 901.7	1.136	2,u	0	0	0	7	3	5	−1	0	12	32
		2,u	0	0	0	7	−1	5	3	0	12	26
		2,u	0	0	0	7	−3	5	5	0	12	25
7 902.0	1.115	0,g^-	0	1	1	1	−1	3	1	2	12	98
7 904.4	1.113	0,g^+	0	0	2	0	0	2	0	2	12	77
7 905.1	1.117	0,u^+	0	2	0	1	1	5	−1	2	12	67
7 905.8	1.136	2,g	0	0	0	8	2	4	0	0	12	37
		2,g	0	0	0	8	0	4	2	0	12	41
7 906.8	1.126	1,u								1	12	<25
7 910.1	1.137	2,g	0	0	0	6	4	6	−2	0	12	26
		2,g	0	0	0	6	−4	6	6	0	12	35
7 913.0	1.115	2,g	0	1	1	1	1	3	1	2	12	56
7 917.5	1.138	0,u^+	0	0	0	5	5	7	−5	0	12	70
		0,u^+	0	0	0	5	1	7	−1	0	12	29
7 919.6	1.113	2,g	0	0	2	0	0	2	2	2	12	60
		2,g	0	1	1	1	−1	3	3	2	12	30
7 920.5	1.125	1,g	1	0	0	3	3	4	−2	1	12	28
		1,g	1	0	0	3	−3	4	4	1	12	40
7 921.1	1.117	2,u	0	2	0	1	1	5	1	2	12	38
		2,u	0	2	0	1	−1	5	3	2	12	34
7 921.5	1.113	0,u^+	2	0	0	1	1	1	−1	2	12	25
		0,u^+	1	0	1	0	0	2	0	2	12	42
7 931.5	1.127	1,g								1	12	<25
7 932.5	1.138	2,u	0	0	0	5	5	7	−3	0	12	26
		2,u	0	0	0	5	−5	7	7	0	12	47
7 932.7	1.125	1,u	0	0	1	3	1	4	0	1	12	44
		1,u	0	0	1	3	−1	4	2	1	12	40
7 937.3	1.113	2,u	1	0	1	0	0	2	2	2	12	52
7 937.8	1.139	0,g^+	0	0	0	4	2	8	−2	0	12	49
		0,g^+	0	0	0	4	0	8	0	0	12	31
7 940.3	1.116	0,u^-	1	1	0	1	−1	3	1	2	12	36
		0,u^-	0	2	0	1	−1	5	1	2	12	48
7 942.3	1.114	0,u^+	1	1	0	1	1	3	−1	2	12	66
7 946.1	1.111	0,u^+	2	0	0	1	1	1	−1	2	12	49
		0,u^+	1	0	1	0	0	2	0	2	12	44
7 949.4	1.112	0,u^-	2	0	0	1	−1	1	1	2	12	68
7 950.2	1.126	1,g								1	12	<25
7 953.6	1.139	2,g	0	0	0	4	2	8	0	0	12	30
		2,g	0	0	0	4	0	8	2	0	12	30
7 954.4	1.116	2,u	0	2	0	1	−1	5	3	2	12	31
7 956.1	1.114	2,u	1	1	0	1	1	3	1	2	12	27
		2,u	1	1	0	1	−1	3	3	2	12	41
7 957.3	1.137	0,g^-	0	0	0	6	−4	6	4	0	12	41
		0,g^-	0	0	0	6	−2	6	2	0	12	56
7 962.1	1.136	0,u^-	0	0	0	7	−1	5	1	0	12	74
7 962.5	1.126	1,g	0	0	1	2	2	5	−1	1	12	28
		1,g	0	0	1	2	0	5	1	1	12	32
7 963.3	1.138	0,u^-	0	0	0	5	−5	7	5	0	12	44
		0,u^-	0	0	0	5	−3	7	3	0	12	36
7 963.4	1.112	2,u	2	0	0	1	1	1	1	2	12	50
		2,u	1	0	1	0	0	2	2	2	12	27
7 966.3	1.115	0,u^-	1	1	0	1	−1	3	1	2	12	63
		0,u^-	0	2	0	1	−1	5	1	2	12	28
7 966.6	1.137	2,g	0	0	0	6	−2	6	4	0	12	35
7 970.2	1.136	2,u	0	0	0	7	1	5	1	0	12	42
		2,u	0	0	0	7	−1	5	3	0	12	30
7 975.2	1.138	2,u								0	12	<25

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
7 976.6	1.128	1,*u*	0	1	0	2	0	7	1	1	12	34
7 976.9	1.115	2,*u*	1	1	0	1	1	3	1	2	12	31
		2,*u*	1	1	0	1	−1	3	3	2	12	32
7 977.2	1.139	0,g^-	0	0	0	4	−4	8	4	0	12	64
		0,g^-	0	0	0	4	−2	8	2	0	12	36
7 977.4	1.126	1,*g*	1	0	0	3	1	4	0	1	12	27
7 985.9	1.115	1,*g*	0	2	0	7	1	0	0	2	13	97
7 987.9	1.126	1,*g*	0	0	1	2	2	5	−1	1	12	33
		1,*g*	0	0	1	2	−2	5	3	1	12	40
7 993.1	1.139	2,*g*	0	0	0	4	4	8	−2	0	12	29
		2,*g*	0	0	0	4	−4	8	6	0	12	34
7 993.1	1.106	0,g^+	0	3	0	4	0	0	0	3	13	99
7 996.9	1.106	2,*g*	0	3	0	4	2	0	0	3	13	99
7 998.5	1.127	1,*g*								1	12	<25
8 010.4	1.126	1,*u*	1	0	0	2	0	5	1	1	12	33
8 018.9	1.128	1,*u*	0	1	0	2	2	7	−1	1	12	33
		1,*u*	0	1	0	2	−2	7	3	1	12	34
8 019.4	1.116	0,u^+	0	1	1	0	0	4	0	2	12	97
8 020.2	1.138	0,u^+	0	0	0	5	3	7	−3	0	12	64
8 024.7	1.126	1,*g*	0	0	1	2	0	5	1	1	12	56
8 024.8	1.139	0,g^+	0	0	0	4	4	8	−4	0	12	73
8 025.3	1.137	0,g^+	0	0	0	6	2	6	−2	0	12	49
		0,g^+	0	0	0	6	0	6	0	0	12	42
8 030.9	1.138	2,*u*	0	0	0	5	3	7	−1	0	12	32
		2,*u*	0	0	0	5	−3	7	5	0	12	32
8 033.2	1.116	2,*u*	0	1	1	0	0	4	2	2	12	97
8 034.5	1.137	2,*g*	0	0	0	6	2	6	0	0	12	31
		2,*g*	0	0	0	6	0	6	2	0	12	42
8 035.4	1.140	0,u^+	0	0	0	3	3	9	−3	0	12	31
		0,u^+	0	0	0	3	1	9	−1	0	12	69
8 038.4	1.139	2,*g*	0	0	0	4	4	8	−2	0	12	32
		2,*g*	0	0	0	4	−4	8	6	0	12	41
8 044.5	1.127	1,*u*	1	0	0	2	2	5	−1	1	12	31
		1,*u*	1	0	0	2	−2	5	3	1	12	37
8 050.7	1.140	2,*u*	0	0	0	3	1	9	1	0	12	36
		2,*u*	0	0	0	3	−1	9	3	0	12	32
8 053.5	1.118	0,g^+	1	1	0	0	0	4	0	2	12	34
		0,g^+	0	2	0	0	0	6	0	2	12	58
8 054.2	1.116	1,*u*	0	2	0	6	2	1	−1	2	13	59
		1,*u*	0	2	0	6	0	1	1	2	13	37
8 068.1	1.127	1,*u*	1	0	0	2	0	5	1	1	12	27
8 068.2	1.118	2,*g*	1	1	0	0	0	4	2	2	12	33
		2,*g*	0	2	0	0	0	6	2	2	12	61
8 069.8	1.113	0,g^+	2	0	0	0	0	2	0	2	12	66
8 078.8	1.127	1,*u*	0	0	1	1	1	6	0	1	12	43
		1,*u*	0	0	1	1	−1	6	2	1	12	44
8 082.5	1.139	0,g^-	0	0	0	4	−4	8	4	0	12	36
		0,g^-	0	0	0	4	−2	8	2	0	12	64
8 083.7	1.113	2,*g*	2	0	0	0	0	2	2	2	12	69
8 085.4	1.140	0,u^-	0	0	0	3	−3	9	3	0	12	81
8 087.3	1.115	0,g^+	1	1	0	0	0	4	0	2	12	61
8 088.3	1.138	0,u^-	0	0	0	5	−1	7	1	0	12	74
8 090.0	1.124	0,g^+	0	1	0	10	0	0	0	1	13	94
8 090.2	1.127	1,*u*	1	0	0	2	0	5	1	1	12	28
		1,*u*	0	1	0	2	0	7	1	1	12	27
8 093.6	1.124	2,*g*	0	1	0	10	2	0	0	1	13	94
8 094.5	1.139	2,*g*	0	0	0	4	2	8	0	0	12	29
		2,*g*	0	0	0	4	−2	8	4	0	12	35
8 098.4	1.116	1,*u*	0	2	0	6	2	1	−1	2	13	38
		1,*u*	0	2	0	6	0	1	1	2	13	60
8 098.4	1.138	2,*u*	0	0	0	5	1	7	1	0	12	40
		2,*u*	0	0	0	5	−1	7	3	0	12	34
8 099.7	1.116	2,*g*	1	1	0	0	0	4	2	2	12	63
8 099.8	1.140	2,*u*	0	0	0	3	3	9	−1	0	12	38

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		2,u	0	0	0	3	−3	9	5	0	12	43
8 104.9	1.107	0,u^+	0	3	0	3	1	1	−1	3	13	98
8 105.2	1.129	1,g	0	1	0	1	1	8	0	1	12	35
		1,g	0	1	0	1	−1	8	2	1	12	34
8 106.7	1.107	2,u	0	3	0	3	3	1	−1	3	13	82
8 112.4	1.097	1,g	0	4	0	1	1	0	0	4	13	100
8 115.8	1.125	0,u^+	0	1	0	9	1	1	−1	1	13	94
8 116.6	1.127	1,u	0	0	1	1	1	6	0	1	12	48
		1,u	0	0	1	1	−1	6	2	1	12	49
8 118.4	1.125	2,u	0	1	0	9	3	1	−1	1	13	62
		2,u	0	1	0	9	1	1	1	1	13	32
8 130.2	1.107	0,u^-	0	3	0	3	−1	1	1	3	13	100
8 134.1	1.117	1,g	0	2	0	5	3	2	−2	2	13	43
		1,g	0	2	0	5	1	2	0	2	13	38
8 136.1	1.107	2,u	0	3	0	3	1	1	1	3	13	83
8 136.2	1.127	1,g	1	0	0	1	1	6	0	1	12	35
		1,g	1	0	0	1	−1	6	2	1	12	34
8 144.4	1.140	0,u^+	0	0	0	3	3	9	−3	0	12	69
		0,u^+	0	0	0	3	1	9	−1	0	12	31
8 145.1	1.141	0,g^+	0	0	0	2	2	10	−2	0	12	54
		0,g^+	0	0	0	2	0	10	0	0	12	46
8 151.1	1.139	0,g^+	0	0	0	4	2	8	−2	0	12	49
		0,g^+	0	0	0	4	0	8	0	0	12	44
8 152.3	1.114	1,u	0	1	1	5	1	0	0	2	13	96
8 153.1	1.126	0,g^+	0	1	0	8	2	2	−2	1	13	51
		0,g^+	0	1	0	8	0	2	0	1	13	42
8 154.4	1.126	2,g	0	1	0	8	4	2	−2	1	13	46
		2,g	0	1	0	8	2	2	0	1	13	37
8 157.4	1.140	2,u	0	0	0	3	3	9	−1	0	12	33
		2,u	0	0	0	3	−3	9	5	0	12	36
8 157.4	1.128	1,g	0	1	0	1	1	8	0	1	12	27
		1,g	0	1	0	1	−1	8	2	1	12	28
8 159.8	1.141	2,g	0	0	0	2	2	10	0	0	12	29
		2,g	0	0	0	2	0	10	2	0	12	46
		2,g	0	0	0	2	−2	10	4	0	12	25
8 162.1	1.139	2,g	0	0	0	4	2	8	0	0	12	27
		2,g	0	0	0	4	0	8	2	0	12	44
8 167.6	1.117	1,g	0	2	0	5	3	2	−2	2	13	42
		1,g	0	2	0	5	−1	2	2	2	13	48
8 176.7	1.125	0,u^-	0	1	0	9	−1	1	1	1	13	95
8 181.2	1.125	2,u	0	1	0	9	3	1	−1	1	13	33
		2,u	0	1	0	9	1	1	1	1	13	62
8 182.3	1.128	1,g	1	0	0	1	1	6	0	1	12	26
		1,g	1	0	0	1	−1	6	2	1	12	28
8 197.0	1.123	0,u^+	0	0	1	8	0	0	0	1	13	97
8 198.0	1.113	1,g	1	1	0	5	1	0	0	2	13	78
8 200.2	1.123	2,u	0	0	1	8	2	0	0	1	13	92
8 201.9	1.126	2,u	0	1	0	7	5	3	−3	1	13	39
		2,u	0	1	0	7	3	3	−1	1	13	32
8 202.2	1.127	0,u^+	0	1	0	7	3	3	−3	1	13	30
		0,u^+	0	1	0	7	1	3	−1	1	13	61
8 203.3	1.126	0,g^-	0	1	0	8	−2	2	2	1	13	95
8 205.8	1.141	0,g^-	0	0	0	2	−2	10	2	0	12	100
8 207.0	1.126	2,g	0	1	0	8	4	2	−2	1	13	39
		2,g	0	1	0	8	0	2	2	1	13	44
8 208.1	1.128	1,g	0	0	1	0	0	7	1	1	12	96
8 211.0	1.117	1,g	0	2	0	5	1	2	0	2	13	53
		1,g	0	2	0	5	−1	2	2	2	13	30
8 213.7	1.140	0,u^-	0	0	0	3	−1	9	1	0	12	81
8 219.5	1.141	2,g	0	0	0	2	2	10	0	0	12	48
		2,g	0	0	0	2	−2	10	4	0	12	52
8 221.8	1.105	0,u^+	0	2	1	2	0	0	0	3	13	98
8 225.6	1.140	2,u	0	0	0	3	1	9	1	0	12	41
		2,u	0	0	0	3	−1	9	3	0	12	39

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8 225.6	1.105	2,*u*	0	2	1	2	2	0	0	3	13	99
8 226.0	1.118	1,*u*	0	2	0	4	4	3	−3	2	13	41
		1,*u*	0	2	0	4	2	3	−1	2	13	31
8 227.7	1.123	$0,g^+$	1	0	0	8	0	0	0	1	13	31
		$0,g^+$	0	0	1	7	1	1	−1	1	13	62
8 229.0	1.108	$0,g^+$	0	3	0	2	2	2	−2	3	13	60
		$0,g^+$	0	3	0	2	0	2	0	3	13	37
8 230.6	1.123	2,*g*	1	0	0	8	2	0	0	1	13	29
		2,*g*	0	0	1	7	3	1	−1	1	13	42
8 237.0	1.114	1,*g*	0	1	1	4	2	1	−1	2	13	47
8 241.8	1.127	$0,u^-$	0	1	0	7	−3	3	3	1	13	77
8 243.1	1.108	$0,g^-$	0	3	0	2	−2	2	2	3	13	99
8 244.2	1.127	2,*u*	0	1	0	7	5	3	−3	1	13	38
		2,*u*	0	1	0	7	1	3	1	1	13	31
8 245.7	1.130	1,*u*	1	0	0	0	0	7	1	1	12	38
		1,*u*	0	1	0	0	0	9	1	1	12	61
8 247.1	1.108	2,*g*	0	3	0	2	2	2	0	3	13	67
		2,*g*	0	3	0	2	0	2	2	3	13	29
8 248.8	1.118	1,*u*	0	2	0	4	4	3	−3	2	13	39
		1,*u*	0	2	0	4	0	3	1	2	13	26
		1,*u*	0	2	0	4	−2	3	3	2	13	28
8 257.5	1.123	$0,g^+$	1	0	0	8	0	0	0	1	13	54
		$0,g^+$	0	0	1	7	1	1	−1	1	13	30
8 259.1	1.123	2,*g*	1	0	0	8	2	0	0	1	13	59
		2,*g*	0	0	1	7	3	1	−1	1	13	27
8 259.6	1.112	1,*g*	0	0	2	3	1	0	0	2	13	71
8 260.7	1.127	2,*g*	0	1	0	6	6	4	−4	1	13	47
		2,*g*	0	1	0	6	4	4	−2	1	13	27
8 263.4	1.127	$0,g^+$	0	1	0	6	2	4	−2	1	13	39
8 263.6	1.126	$0,g^+$	0	1	0	8	2	2	−2	1	13	38
		$0,g^+$	0	1	0	8	0	2	0	1	13	39
8 264.7	1.107	$0,g^+$	0	3	0	2	2	2	−2	3	13	36
		$0,g^+$	0	3	0	2	0	2	0	3	13	48
8 266.8	1.142	$0,u^+$	0	0	0	1	1	11	−1	0	12	100
8 267.1	1.115	1,*g*	0	1	1	4	2	1	−1	2	13	29
		1,*g*	0	1	1	4	0	1	1	2	13	67
8 268.7	1.126	2,*g*	0	1	0	8	2	2	0	1	13	45
		2,*g*	0	1	0	8	0	2	2	1	13	37
8 270.0	1.124	$0,u^+$	1	0	0	7	1	1	−1	1	13	51
8 272.2	1.124	2,*u*	1	0	0	7	3	1	−1	1	13	35
8 272.4	1.113	1,*u*	1	0	1	3	1	0	0	2	13	42
8 273.6	1.107	2,*g*	0	3	0	2	0	2	2	3	13	60
8 274.8	1.129	1,*u*	1	0	0	0	0	7	1	1	12	61
		1,*u*	0	1	0	0	0	9	1	1	12	39
8 276.1	1.098	1,*u*	0	4	0	0	0	1	1	4	13	100
8 276.1	1.141	$0,g^+$	0	0	0	2	2	10	−2	0	12	46
		$0,g^+$	0	0	0	2	0	10	0	0	12	54
8 276.2	1.105	$0,g^+$	1	2	0	2	0	0	0	3	13	81
8 280.1	1.105	2,*g*	1	2	0	2	2	0	0	3	13	72
8 280.5	1.117	1,*u*	0	2	0	4	2	3	−1	2	13	33
		1,*u*	0	2	0	4	−2	3	3	2	13	36
8 280.9	1.142	2,*u*	0	0	0	1	1	11	1	0	12	51
		2,*u*	0	0	0	1	−1	11	3	0	12	49
8 284.3	1.123	$0,g^-$	0	0	1	7	−1	1	1	1	13	98
8 288.7	1.141	2,*g*	0	0	0	2	0	10	2	0	12	54
8 289.6	1.123	2,*g*	0	0	1	7	3	1	−1	1	13	25
		2,*g*	0	0	1	7	1	1	1	1	13	70
8 289.8	1.127	$0,u^+$	0	1	0	7	3	3	−3	1	13	60
		$0,u^+$	0	1	0	7	1	3	−1	1	13	34
8 292.7	1.127	2,*g*	0	1	0	6	6	4	−4	1	13	34
8 292.7	1.127	$0,g^-$	0	1	0	6	−4	4	4	1	13	63
		$0,g^-$	0	1	0	6	−2	4	2	1	13	30
8 293.5	1.113	1,*u*	1	0	1	3	1	0	0	2	13	40
		1,*u*	1	1	0	4	2	1	−1	2	13	33

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8 294.9	1.127	2,u	0	1	0	7	3	3	−1	1	13	38
		2,u	0	1	0	7	−1	3	3	1	13	43
8 295.1	1.135	1,g	0	0	0	11	3	2	−2	0	13	35
		1,g	0	0	0	11	1	2	0	0	13	46
8 299.9	1.136	1,u	0	0	0	10	2	3	−1	0	13	39
		1,u	0	0	0	10	0	3	1	0	13	28
8 302.1	1.134	1,u	0	0	0	12	2	1	−1	0	13	56
		1,u	0	0	0	12	0	1	1	0	13	44
8 305.5	1.124	2,u	0	0	1	6	4	2	−2	1	13	44
8 307.8	1.124	0,u^+	1	0	0	7	1	1	−1	1	13	44
		0,u^+	0	0	1	6	2	2	−2	1	13	29
8 312.3	1.115	1,u	1	1	0	4	0	1	1	2	13	44
8 316.7	1.137	1,g	0	0	0	9	3	4	−2	0	13	32
		1,g	0	0	0	9	1	4	0	0	13	29
8 317.2	1.124	0,u^-	1	0	0	7	−1	1	1	1	13	32
		0,u^-	0	0	1	6	−2	2	2	1	13	62
8 321.0	1.133	1,g	0	0	0	13	1	0	0	0	13	100
8 322.8	1.124	2,u	0	0	1	6	0	2	2	1	13	33
8 323.6	1.125	0,g^+	1	0	0	6	2	2	−2	1	13	28
8 324.5	1.117	1,u	0	2	0	4	0	3	1	2	13	42
8 325.8	1.124	2,g	1	0	0	6	4	2	−2	1	13	37
8 330.1	1.127	0,g^+	0	1	0	6	4	4	−4	1	13	46
8 330.2	1.115	1,u	0	1	1	3	3	2	−2	2	13	43
8 334.0	1.127	2,g	0	1	0	6	4	4	−2	1	13	33
		2,g	0	1	0	6	−2	4	4	1	13	28
8 337.5	1.128	0,u^+	0	1	0	5	3	5	−3	1	13	31
		0,u^+	0	1	0	5	1	5	−1	1	13	41
8 338.3	1.142	0,u^-	0	0	0	1	−1	11	1	0	12	100
8 339.1	1.118	1,g	0	2	0	3	1	4	0	2	13	31
8 342.1	1.124	0,u^-	1	0	0	7	−1	1	1	1	13	47
		0,u^-	0	0	1	6	−2	2	2	1	13	30
8 345.6	1.137	1,u	0	0	0	8	4	5	−3	0	13	28
		1,u	0	0	0	8	2	5	−1	0	13	26
8 346.1	1.124	2,u	1	0	0	7	1	1	1	1	13	42
8 348.1	1.105	0,g^+	0	2	1	1	1	1	−1	3	13	92
8 349.7	1.128	2,u	0	1	0	5	5	5	−3	1	13	28
		2,u	0	1	0	5	3	5	−1	1	13	30
8 350.4	1.126	0,u^-	0	1	0	7	−1	3	1	1	13	61
8 351.5	1.142	2,u	0	0	0	1	1	11	1	0	12	49
		2,u	0	0	0	1	−1	11	3	0	12	51
8 351.6	1.115	1,u	0	1	1	3	−1	2	2	2	13	36
8 356.1	1.126	2,u	0	1	0	7	1	3	1	1	13	43
8 356.5	1.136	1,u	0	0	0	10	4	3	−3	0	13	43
		1,u	0	0	0	10	−2	3	3	0	13	35
8 357.0	1.128	0,u^-	0	1	0	5	−5	5	5	1	13	58
		0,u^-	0	1	0	5	−3	5	3	1	13	31
8 359.8	1.113	1,u	0	0	2	2	2	1	−1	2	13	54
8 360.0	1.125	2,g	0	0	1	5	5	3	−3	1	13	62
8 361.0	1.118	1,g	0	2	0	3	−3	4	4	2	13	45
8 361.0	1.106	0,g^-	0	2	1	1	−1	1	1	3	13	99
8 361.2	1.125	0,g^-	1	0	0	6	−2	2	2	1	13	55
		0,g^-	0	0	1	5	−3	3	3	1	13	25
8 362.3	1.135	1,g	0	0	0	11	3	2	−2	0	13	48
		1,g	0	0	0	11	−1	2	2	0	13	50
8 362.9	1.137	1,g	0	0	0	9	5	4	−4	0	13	38
		1,g	0	0	0	9	−1	4	2	0	13	28
8 367.7	1.124	2,g	1	0	0	6	4	2	−2	1	13	43
8 368.5	1.114	1,g	1	0	1	2	2	1	−1	2	13	34
8 368.9	1.106	2,g	0	2	1	1	1	1	1	3	13	98
8 369.0	1.125	0,g^+	0	0	1	5	3	3	−3	1	13	27
		0,g^+	0	0	1	5	1	3	−1	1	13	39
8 371.4	1.124	0,u^+	0	0	1	6	2	2	−2	1	13	43
		0,u^+	0	0	1	6	0	2	0	1	13	55
8 373.9	1.109	0,u^+	0	3	0	1	1	3	−1	3	13	89

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8 375.8	1.127	$0,g^-$	0	1	0	6	−2	4	2	1	13	65
8 376.2	1.113	$1,u$	0	0	2	2	0	1	1	2	13	54
8 378.6	1.124	$2,u$	0	0	1	6	2	2	0	1	13	41
		$2,u$	0	0	1	6	0	2	2	1	13	48
8 379.1	1.128	$0,u^+$	0	1	0	5	5	5	−5	1	13	67
8 380.0	1.134	$1,u$	0	0	0	12	2	1	−1	0	13	44
		$1,u$	0	0	0	12	0	1	1	0	13	56
8 381.4	1.115	$1,u$	0	1	1	3	1	2	0	2	13	44
		$1,u$	0	1	1	3	−1	2	2	2	13	45
8 381.6	1.137	$1,u$	0	0	0	8	6	5	−5	0	13	35
8 382.7	1.127	$2,g$	0	1	0	6	−2	4	4	1	13	31
8 383.5	1.128	$2,u$	0	1	0	5	5	5	−3	1	13	29
		$2,u$	0	1	0	5	−1	5	3	1	13	27
8 386.3	1.116	$1,g$	0	2	0	3	−3	4	4	2	13	26
8 387.1	1.138	$1,g$	0	0	0	7	5	6	−4	0	13	25
8 390.2	1.103	$0,g^+$	0	1	2	0	0	0	0	3	13	84
8 390.6	1.109	$2,u$	0	3	0	1	1	3	1	3	13	52
		$2,u$	0	3	0	1	−1	3	3	3	13	43
8 391.5	1.114	$1,g$	1	1	0	3	3	2	−2	2	13	32
8 393.5	1.125	$0,u^+$	1	0	0	5	3	3	−3	1	13	25
		$0,u^+$	1	0	0	5	1	3	−1	1	13	42
8 393.9	1.125	$0,g^-$	1	0	0	6	−2	2	2	1	13	41
		$0,g^-$	0	0	1	5	−3	3	3	1	13	45
8 394.4	1.125	$2,u$	1	0	0	5	5	3	−3	1	13	44
8 395.4	1.125	$2,g$								1	13	<25
8 395.6	1.115	$1,g$								2	13	<25
8 398.3	1.108	$0,u^-$	0	3	0	1	−1	3	1	3	13	82
8 400.4	1.143	$0,g^+$	0	0	0	0	0	12	0	0	12	100
8 401.8	1.105	$0,u^+$	1	2	0	1	1	1	−1	3	13	76
8 406.4	1.125	$0,g^+$	0	0	1	5	3	3	−3	1	13	37
8 410.8	1.127	$0,u^-$	0	1	0	5	−5	5	5	1	13	34
8 411.3	1.114	$1,g$	1	1	0	3	−1	2	2	2	13	28
8 411.6	1.108	$2,u$	0	3	0	1	1	3	1	3	13	30
		$2,u$	0	3	0	1	−1	3	3	3	13	54
8 412.6	1.138	$1,g$	0	0	0	7	7	6	−6	0	13	39
8 414.0	1.143	$2,g$	0	0	0	0	0	12	2	0	12	100
8 414.3	1.125	$2,g$	1	0	0	6	2	2	0	1	13	25
		$2,g$	0	0	1	5	−1	3	3	1	13	35
8 417.3	1.137	$1,g$	0	0	0	9	5	4	−4	0	13	30
		$1,g$	0	0	0	9	−3	4	4	0	13	39
8 418.4	1.106	$0,u^-$	1	2	0	1	−1	1	1	3	13	82
8 418.9	1.127	$2,u$	0	1	0	5	−3	5	5	1	13	31
8 420.1	1.112	$1,g$	2	0	0	3	1	0	0	2	13	57
8 422.1	1.136	$1,u$	0	0	0	10	4	3	−3	0	13	27
		$1,u$	0	0	0	10	2	3	−1	0	13	25
		$1,u$	0	0	0	10	−2	3	3	0	13	41
8 422.8	1.126	$0,u^-$	1	0	0	5	−3	3	3	1	13	42
8 423.0	1.103	$0,u^+$	1	1	1	0	0	0	0	3	13	85
8 424.9	1.137	$1,u$	0	0	0	8	6	5	−5	0	13	29
		$1,u$	0	0	0	8	−4	5	5	0	13	33
8 425.0	1.106	$2,u$	1	2	0	1	1	1	1	3	13	79
8 425.2	1.116	$1,g$								2	13	<25
8 426.3	1.125	$0,g^+$								1	13	<25
8 426.8	1.127	$2,u$								1	13	<25
8 429.5	1.129	$0,g^+$	0	1	0	4	2	6	−2	1	13	40
8 432.8	1.125	$2,g$	1	0	0	6	0	2	2	1	13	27
8 437.0	1.127	$0,g^+$	0	1	0	6	2	4	−2	1	13	35
		$0,g^+$	0	1	0	6	0	4	0	1	13	31
8 439.0	1.135	$1,g$	0	0	0	11	1	2	0	0	13	52
		$1,g$	0	0	0	11	−1	2	2	0	13	30
8 439.6	1.117	$1,g$	0	2	0	3	1	4	0	2	13	27
8 442.0	1.126	$0,u^+$	0	0	1	4	4	4	−4	1	13	32
		$0,u^+$	0	0	1	4	2	4	−2	1	13	30
8 443.5	1.127	$2,g$	0	1	0	6	2	4	0	1	13	30

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		2,*g*	0	1	0	6	0	4	2	1	13	33
8 444.9	1.138	1,*g*	0	0	0	7	−5	6	6	0	13	27
8 445.5	1.129	2,*g*	0	1	0	4	2	6	0	1	13	28
8 448.2	1.116	1,*g*	0	1	1	2	0	3	1	2	13	26
8 449.8	1.139	1,*u*								0	13	<25
8 450.4	1.126	$0,u^+$	1	0	0	5	3	3	−3	1	13	39
8 453.9	1.126	2,*u*	0	0	1	4	4	4	−2	1	13	45
8 455.0	1.126	$0,u^-$	0	0	1	4	−4	4	4	1	13	59
8 458.2	1.127	$0,g^-$	0	0	1	5	−1	3	1	1	13	49
8 458.5	1.127	$0,g^-$	0	0	1	5	−1	3	1	1	13	34
		$0,g^-$	0	1	0	4	−4	6	4	1	13	34
8 459.8	1.126	2,*u*	1	0	0	5	3	3	−1	1	13	35
8 462.3	1.128	$0,u^+$	0	1	0	5	3	5	−3	1	13	42
8 463.3	1.119	1,*u*	0	2	0	2	0	5	1	2	13	33
8 465.6	1.116	1,*g*	0	1	1	2	2	3	−1	2	13	37
		1,*g*	0	1	1	2	−2	3	3	2	13	38
8 467.2	1.125	2,*g*	0	0	1	5	1	3	1	1	13	49
		2,*g*	0	0	1	5	−1	3	3	1	13	29
8 471.2	1.128	2,*u*	0	1	0	5	3	5	−1	1	13	28
8 474.7	1.126	$0,g^+$	1	0	0	4	2	4	−2	1	13	36
8 476.6	1.129	2,*g*	0	1	0	4	−4	6	6	1	13	32
8 477.4	1.137	1,*u*	0	0	0	8	4	5	−3	0	13	27
		1,*u*	0	0	0	8	−4	5	5	0	13	33
8 477.8	1.139	1,*u*								0	13	<25
8 479.1	1.114	1,*g*	0	0	2	1	1	2	0	2	13	41
		1,*g*	0	0	2	1	−1	2	2	2	13	27
8 479.1	1.126	$0,u^+$	0	0	1	4	4	4	−4	1	13	32
8 481.5	1.137	1,*g*	0	0	0	9	3	4	−2	0	13	34
		1,*g*	0	0	0	9	−3	4	4	0	13	27
8 485.6	1.138	1,*g*	0	0	0	7	−5	6	6	0	13	36
8 485.8	1.114	1,*u*	1	0	1	1	1	2	0	2	13	30
8 485.9	1.126	2,*u*	0	0	1	4	4	4	−2	1	13	27
8 489.7	1.126	2,*g*	1	0	0	4	4	4	−2	1	13	26
		2,*g*	1	0	0	4	2	4	0	1	13	27
8 492.0	1.115	1,*g*	0	0	2	1	1	2	0	2	13	27
		1,*g*	0	0	2	1	−1	2	2	2	13	31
8 493.2	1.129	$0,g^+$	0	1	0	4	4	6	−4	1	13	55
8 493.5	1.126	$0,g^-$	1	0	0	4	−4	4	4	1	13	63
8 494.3	1.118	1,*u*	0	2	0	2	2	5	−1	2	13	32
		1,*u*	0	2	0	2	−2	5	3	2	13	34
8 495.1	1.126	$0,u^-$	0	0	1	4	−2	4	2	1	13	46
8 495.5	1.116	1,*g*	0	1	1	2	0	3	1	2	13	46
8 497.7	1.136	1,*u*	0	0	0	10	2	3	−1	0	13	34
		1,*u*	0	0	0	10	0	3	1	0	13	45
8 499.0	1.107	$0,u^+$	0	2	1	0	0	2	0	3	13	98
8 505.0	1.126	2,*u*	0	0	1	4	−2	4	4	1	13	29
8 506.3	1.139	1,*u*	0	0	0	6	6	7	−5	0	13	26
		1,*u*	0	0	0	6	−6	7	7	0	13	42
8 507.1	1.129	2,*g*	0	1	0	4	−4	6	6	1	13	41
8 509.3	1.115	1,*u*								2	13	<25
8 510.1	1.126	$0,u^-$	1	0	0	5	−1	3	1	1	13	32
		$0,u^-$	0	1	0	5	−1	5	1	1	13	27
8 511.4	1.115	1,*u*	1	0	1	1	−1	2	2	2	13	36
		1,*u*	1	1	0	2	2	3	−1	2	13	26
8 512.6	1.107	2,*u*	0	2	1	0	0	2	2	3	13	98
8 516.7	1.126	$0,g^+$	1	0	0	4	4	4	−4	1	13	56
8 519.2	1.126	2,*u*								1	13	<25
8 522.5	1.127	2,*g*	1	0	0	4	4	4	−2	1	13	26
8 523.4	1.127	$0,u^-$	0	1	0	5	−1	5	1	1	13	49
8 523.9	1.140	1,*g*	0	0	0	5	1	8	0	0	13	27
8 525.0	1.112	1,*u*	2	0	0	2	2	1	−1	2	13	48
		1,*u*	1	0	1	1	1	2	0	2	13	26
8 529.0	1.115	1,*u*	1	1	0	2	−2	3	3	2	13	35
8 530.7	1.109	$0,g^+$	0	3	0	0	0	4	0	3	13	78

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8 530.9	1.128	2,*u*	0	1	0	5	1	5	1	1	13	31
8 532.1	1.116	1,*u*								2	13	<25
8 534.7	1.130	0,u^+	0	1	0	3	3	7	−3	1	13	26
		0,u^+	0	1	0	3	1	7	−1	1	13	53
8 536.2	1.127	0,g^-	1	0	0	4	−2	4	2	1	13	28
		0,g^-	0	1	0	4	−2	6	2	1	13	29
8 536.7	1.138	1,*g*	0	0	0	7	5	6	−4	0	13	26
8 537.0	1.127	0,g^+	0	0	1	3	3	5	−3	1	13	32
		0,g^+	0	0	1	3	1	5	−1	1	13	45
8 539.7	1.114	1,*u*	2	0	0	2	0	1	1	2	13	45
8 540.5	1.137	1,*u*	0	0	0	8	4	5	−3	0	13	25
		1,*u*	0	0	0	8	−2	5	3	0	13	33
8 544.5	1.139	1,*u*	0	0	0	6	−6	7	7	0	13	25
8 545.0	1.126	0,u^+	0	0	1	4	2	4	−2	1	13	45
		0,u^+	0	0	1	4	0	4	0	1	13	49
8 545.8	1.109	2,*g*	0	3	0	0	0	4	2	3	13	83
8 546.9	1.127	2,*g*								1	13	<25
8 550.6	1.128	0,g^-	0	0	1	3	−3	5	3	1	13	36
		0,g^-	0	1	0	4	−2	6	2	1	13	33
8 550.7	1.130	2,*u*	0	1	0	3	1	7	1	1	13	30
8 552.2	1.104	0,g^+	2	1	0	0	0	0	0	3	13	52
		0,g^+	1	2	0	0	0	2	0	3	13	28
8 552.5	1.127	2,*g*	0	0	1	3	3	5	−1	1	13	28
8 555.4	1.126	2,*u*	0	0	1	4	2	4	0	1	13	28
		2,*u*	0	0	1	4	0	4	2	1	13	48
8 555.8	1.117	1,*u*	1	1	0	2	0	3	1	2	13	32
8 556.3	1.137	1,*g*	0	0	0	9	1	4	0	0	13	42
		1,*g*	0	0	0	9	−1	4	2	0	13	32
8 559.5	1.140	1,*g*	0	0	0	5	−5	8	6	0	13	25
8 562.0	1.128	2,*g*								1	13	<25
8 563.1	1.104	0,g^+	2	1	0	0	0	0	0	3	13	36
		0,g^+	1	2	0	0	0	2	0	3	13	51
8 563.2	1.127	0,g^-	1	0	0	4	−2	4	2	1	13	37
		0,g^-	0	0	1	3	−3	5	3	1	13	40
8 571.2	1.106	2,*g*	1	2	0	0	0	2	2	3	13	83
8 573.3	1.129	0,u^-	0	1	0	3	−3	7	3	1	13	62
8 575.5	1.127	0,u^+	1	0	0	3	3	5	−3	1	13	27
		0,u^+	1	0	0	3	1	5	−1	1	13	49
8 576.3	1.127	2,*g*	0	0	1	3	3	5	−1	1	13	28
		2,*g*	0	0	1	3	−3	5	5	1	13	30
8 578.0	1.117	1,*u*	0	1	1	1	1	4	0	2	13	40
		1,*u*	0	1	1	1	−1	4	2	2	13	40
8 583.3	1.127	0,g^+	0	0	1	3	3	5	−3	1	13	34
8 584.5	1.107	1,*g*	0	3	0	5	1	0	0	3	14	99
8 588.3	1.129	2,*u*	0	1	0	3	−3	7	5	1	13	35
8 592.0	1.128	2,*u*								1	13	<25
8 593.7	1.127	0,g^+								1	13	<25
8 594.7	1.126	2,*g*								1	13	<25
8 595.0	1.139	1,*u*	0	0	0	6	4	7	−3	0	13	27
		1,*u*	0	0	0	6	−4	7	5	0	13	32
8 599.1	1.138	1,*g*	0	0	0	7	3	6	−2	0	13	31
		1,*g*	0	0	0	7	−3	6	4	0	13	30
8 599.6	1.119	1,*g*	0	2	0	1	1	6	0	2	13	33
		1,*g*	0	2	0	1	−1	6	2	2	13	32
8 600.9	1.140	1,*g*	0	0	0	5	5	8	−4	0	13	32
		1,*g*	0	0	0	5	−5	8	6	0	13	38
8 604.9	1.116	0,g^+	0	2	0	8	0	0	0	2	14	96
8 605.1	1.127	2,*g*								1	13	<25
8 605.1	1.127	0,u^-	1	0	0	3	−3	5	3	1	13	64
8 606.5	1.116	1,*u*	0	0	2	0	0	3	1	2	13	38
		1,*u*	0	1	1	1	1	4	0	2	13	45
8 608.6	1.116	2,*g*	0	2	0	8	2	0	0	2	14	96
8 608.9	1.116	1,*u*	0	0	2	0	0	3	1	2	13	39
		1,*u*	0	1	1	1	−1	4	2	2	13	44

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8 609.7	1.128	$0,g^+$	0	1	0	4	2	6	−2	1	13	30
		$0,g^+$	0	1	0	4	0	6	0	1	13	27
8 609.9	1.141	$1,u$	0	0	0	4	2	9	−1	0	13	27
		$1,u$	0	0	0	4	0	9	1	0	13	31
8 614.6	1.137	$1,u$	0	0	0	8	2	5	−1	0	13	29
		$1,u$	0	0	0	8	0	5	1	0	13	41
8 618.4	1.128	$2,g$	0	1	0	4	0	6	2	1	13	27
8 619.2	1.115	$1,g$	1	0	1	0	0	3	1	2	13	37
8 619.2	1.129	$0,u^+$	0	1	0	3	3	7	−3	1	13	43
8 620.0	1.127	$2,u$	1	0	0	3	3	5	−1	1	13	25
		$2,u$	1	0	0	3	−3	5	5	1	13	40
8 631.5	1.127	$0,g^-$	0	0	1	3	−1	5	1	1	13	83
8 632.4	1.129	$2,u$								1	13	<25
8 639.3	1.128	$0,u^+$	0	0	1	2	2	6	−2	1	13	31
8 640.7	1.118	$1,g$	0	2	0	1	−1	6	2	2	13	27
8 642.9	1.116	$1,g$	1	1	0	1	1	4	0	2	13	30
		$1,g$	1	1	0	1	−1	4	2	2	13	35
8 643.2	1.127	$2,g$	0	0	1	3	1	5	1	1	13	42
		$2,g$	0	0	1	3	−1	5	3	1	13	38
8 646.7	1.128	$0,u^+$	1	0	0	3	1	5	−1	1	13	29
8 648.3	1.113	$1,g$	2	0	0	1	−1	2	2	2	13	39
		$1,g$	1	0	1	0	0	3	1	2	13	41
8 652.1	1.130	$0,g^+$	0	1	0	2	2	8	−2	1	13	40
		$0,g^+$	0	1	0	2	0	8	0	1	13	34
8 652.3	1.140	$1,g$								0	13	<25
8 652.5	1.128	$2,u$								1	13	<25
8 653.9	1.114	$1,g$	2	0	0	1	1	2	0	2	13	40
8 655.2	1.141	$1,u$	0	0	0	4	4	9	−3	0	13	30
		$1,u$	0	0	0	4	−4	9	5	0	13	32
8 657.2	1.139	$1,u$	0	0	0	6	−2	7	3	0	13	29
8 660.0	1.128	$2,u$	0	0	1	2	2	6	0	1	13	25
8 662.5	1.117	$0,u^+$	0	2	0	7	1	1	−1	2	14	95
8 665.1	1.117	$2,u$	0	2	0	7	3	1	−1	2	14	66
		$2,u$	0	2	0	7	1	1	1	2	14	30
8 667.5	1.130	$2,g$	0	1	0	2	0	8	2	1	13	34
8 670.6	1.128	$0,u^-$	0	0	1	2	−2	6	2	1	13	44
8 672.2	1.117	$1,g$	1	1	0	1	1	4	0	2	13	30
		$1,g$	1	1	0	1	−1	4	2	2	13	31
8 672.7	1.098	$0,g^+$	0	4	0	2	0	0	0	4	14	100
8 672.8	1.138	$1,g$	0	0	0	7	1	6	0	0	13	38
		$1,g$	0	0	0	7	−1	6	2	0	13	33
8 676.6	1.098	$2,g$	0	4	0	2	2	0	0	4	14	100
8 677.1	1.128	$0,u^-$	0	0	1	2	−2	6	2	1	13	48
		$0,u^-$	0	1	0	3	−1	7	1	1	13	28
8 682.9	1.128	$2,u$								1	13	<25
8 684.8	1.108	$1,u$	0	3	0	4	2	1	−1	3	14	64
		$1,u$	0	3	0	4	0	1	1	3	14	34
8 689.6	1.128	$0,g^+$	1	0	0	2	2	6	−2	1	13	41
		$0,g^+$	1	0	0	2	0	6	0	1	13	33
8 690.3	1.128	$2,u$	0	0	1	2	2	6	0	1	13	28
		$2,u$	0	0	1	2	−2	6	4	1	13	35
8 696.0	1.129	$0,u^-$	1	0	0	3	−1	5	1	1	13	37
		$0,u^-$	0	1	0	3	−1	7	1	1	13	44
8 700.9	1.130	$0,g^-$	1	0	0	2	−2	6	2	1	13	31
		$0,g^-$	0	1	0	2	−2	8	2	1	13	66
8 704.6	1.128	$2,g$	1	0	0	2	0	6	2	1	13	32
8 706.0	1.129	$2,u$								1	13	<25
8 708.0	1.142	$1,g$	0	0	0	3	1	10	0	0	13	35
		$1,g$	0	0	0	3	−1	10	2	0	13	34
8 708.5	1.141	$1,u$	0	0	0	4	4	9	−3	0	13	35
		$1,u$	0	0	0	4	−4	9	5	0	13	38
8 712.2	1.117	$0,u^-$	0	2	0	7	−1	1	1	2	14	97
8 714.8	1.140	$1,g$	0	0	0	5	3	8	−2	0	13	32
		$1,g$	0	0	0	5	−3	8	4	0	13	32

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8 715.1	1.130	2,*g*	0	1	0	2	2	8	0	1	13	33
		2,*g*	0	1	0	2	−2	8	4	1	13	34
8 717.1	1.117	2,*u*	0	2	0	7	3	1	−1	2	14	31
		2,*u*	0	2	0	7	1	1	1	2	14	66
8 717.2	1.108	1,*u*	0	3	0	4	2	1	−1	3	14	35
		1,*u*	0	3	0	4	0	1	1	3	14	64
8 717.8	1.128	$0,u^+$	0	0	1	2	2	6	−2	1	13	42
		$0,u^+$	0	0	1	2	0	6	0	1	13	55
8 720.1	1.118	1,*g*	0	1	1	0	0	5	1	2	13	97
8 730.5	1.128	2,*u*	0	0	1	2	0	6	2	1	13	53
8 730.5	1.128	$0,g^-$	1	0	0	2	−2	6	2	1	13	67
		$0,g^-$	0	1	0	2	−2	8	2	1	13	33
8 730.8	1.139	1,*u*	0	0	0	6	2	7	−1	0	13	27
		1,*u*	0	0	0	6	0	7	1	0	13	41
8 731.8	1.118	$0,g^+$	0	2	0	6	2	2	−2	2	14	52
		$0,g^+$	0	2	0	6	0	2	0	2	14	42
8 732.9	1.118	2,*g*	0	2	0	6	4	2	−2	2	14	53
		2,*g*	0	2	0	6	2	2	0	2	14	33
8 740.7	1.125	1,*g*	0	1	0	11	1	0	0	1	14	91
8 743.7	1.128	2,*g*	1	0	0	2	2	6	0	1	13	29
		2,*g*	1	0	0	2	−2	6	4	1	13	38
8 748.7	1.119	1,*u*	1	1	0	0	0	5	1	2	13	35
		1,*u*	0	2	0	0	0	7	1	2	13	58
8 755.5	1.126	1,*u*	0	1	0	10	2	1	−1	1	14	53
		1,*u*	0	1	0	10	0	1	1	1	14	39
8 756.6	1.129	$0,g^+$	1	0	0	2	2	6	−2	1	13	27
8 760.9	1.129	$0,g^+$	0	0	1	1	1	7	−1	1	13	75
8 762.0	1.115	$0,u^+$	0	1	1	6	0	0	0	2	14	94
8 763.7	1.142	1,*g*	0	0	0	3	3	10	−2	0	13	39
		1,*g*	0	0	0	3	−3	10	4	0	13	41
8 765.7	1.115	2,*u*	0	1	1	6	2	0	0	2	14	94
8 768.7	1.115	1,*u*	2	0	0	0	0	3	1	2	13	62
8 769.3	1.129	2,*g*								1	13	<25
8 770.7	1.118	$0,g^-$	0	2	0	6	−2	2	2	2	14	96
8 771.9	1.141	1,*u*	0	0	0	4	2	9	−1	0	13	30
		1,*u*	0	0	0	4	−2	9	3	0	13	32
8 774.5	1.118	2,*g*	0	2	0	6	4	2	−2	2	14	36
		2,*g*	0	2	0	6	0	2	2	2	14	43
8 775.1	1.129	2,*g*	0	0	1	1	1	7	1	1	13	41
		2,*g*	0	0	1	1	−1	7	3	1	13	41
8 781.7	1.127	1,*g*	0	1	0	9	3	2	−2	1	14	34
		1,*g*	0	1	0	9	1	2	0	1	14	41
8 781.7	1.131	$0,u^+$	1	0	0	1	1	7	−1	1	13	28
		$0,u^+$	0	1	0	1	1	9	−1	1	13	69
8 782.4	1.129	$0,g^+$	1	0	0	2	0	6	0	1	13	29
		$0,g^+$	0	1	0	2	0	8	0	1	13	26
8 788.4	1.117	1,*u*	1	1	0	0	0	5	1	2	13	59
8 788.6	1.140	1,*g*	0	0	0	5	1	8	0	0	13	38
		1,*g*	0	0	0	5	−1	8	2	0	13	35
8 793.7	1.129	2,*g*	1	0	0	2	0	6	2	1	13	28
		2,*g*	0	1	0	2	0	8	2	1	13	26
8 796.3	1.131	2,*u*	0	1	0	1	1	9	1	1	13	35
		2,*u*	0	1	0	1	−1	9	3	1	13	34
8 796.8	1.109	1,*g*	0	3	0	3	3	2	−2	3	14	55
		1,*g*	0	3	0	3	1	2	0	3	14	32
8 803.2	1.114	$0,g^+$	1	1	0	6	0	0	0	2	14	68
8 803.9	1.106	1,*u*	0	2	1	3	1	0	0	3	14	98
8 804.0	1.129	$0,g^-$	0	0	1	1	−1	7	1	1	13	97
8 807.2	1.114	2,*g*	1	1	0	6	2	0	0	2	14	69
8 812.1	1.119	2,*u*	0	2	0	5	5	3	−3	2	14	55
		2,*u*	0	2	0	5	3	3	−1	2	14	27
8 813.1	1.119	$0,u^+$	0	2	0	5	3	3	−3	2	14	32
		$0,u^+$	0	2	0	5	1	3	−1	2	14	59
8 816.5	1.129	$0,u^+$	1	0	0	1	1	7	−1	1	13	69

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,u^+$	0	1	0	1	1	9	−1	1	13	30
8 816.9	1.099	$0,u^+$	0	4	0	1	1	1	−1	4	14	99
8 817.4	1.129	$2,g$	0	0	1	1	1	7	1	1	13	46
		$2,g$	0	0	1	1	−1	7	3	1	13	48
8 818.2	1.143	$1,u$	0	0	0	2	2	11	−1	0	13	27
		$1,u$	0	0	0	2	0	11	1	0	13	47
		$1,u$	0	0	0	2	−2	11	3	0	13	26
8 818.5	1.109	$1,g$	0	3	0	3	3	2	−2	3	14	36
		$1,g$	0	3	0	3	−1	2	2	3	14	48
8 819.2	1.118	$0,g^+$	0	2	0	6	2	2	−2	2	14	38
		$0,g^+$	0	2	0	6	0	2	0	2	14	56
8 819.4	1.128	$1,u$	0	1	0	8	2	3	−1	1	14	35
8 822.7	1.126	$1,u$	0	1	0	10	2	1	−1	1	14	40
		$1,u$	0	1	0	10	0	1	1	1	14	53
8 825.2	1.118	$2,g$	0	2	0	6	2	2	0	2	14	48
		$2,g$	0	2	0	6	0	2	2	2	14	41
8 828.5	1.142	$1,g$	0	0	0	3	3	10	−2	0	13	34
		$1,g$	0	0	0	3	−3	10	4	0	13	35
8 829.7	1.099	$0,u^-$	0	4	0	1	−1	1	1	4	14	100
8 830.6	1.129	$2,u$	1	0	0	1	1	7	1	1	13	35
		$2,u$	1	0	0	1	−1	7	3	1	13	34
8 837.0	1.099	$2,u$	0	4	0	1	1	1	1	4	14	100
8 838.3	1.127	$1,g$	0	1	0	9	3	2	−2	1	14	44
		$1,g$	0	1	0	9	−1	2	2	1	14	46
8 839.3	1.115	$0,g^+$	0	1	1	5	1	1	−1	2	14	60
8 840.2	1.124	$1,u$	0	0	1	9	1	0	0	1	14	98
8 840.5	1.130	$0,u^-$	1	0	0	1	−1	7	1	1	13	43
		$0,u^-$	0	1	0	1	−1	9	1	1	13	56
8 840.6	1.115	$2,g$	0	1	1	5	3	1	−1	2	14	51
8 841.4	1.119	$0,u^-$	0	2	0	5	−3	3	3	2	14	79
8 843.2	1.119	$2,u$	0	2	0	5	5	3	−3	2	14	32
		$2,u$	0	2	0	5	1	3	1	2	14	33
8 846.1	1.141	$1,u$	0	0	0	4	2	9	−1	0	13	26
		$1,u$	0	0	0	4	0	9	1	0	13	44
8 846.9	1.108	$1,g$	1	2	0	3	1	0	0	3	14	26
		$1,g$	0	3	0	3	1	2	0	3	14	33
		$1,g$	0	3	0	3	−1	2	2	3	14	34
8 853.9	1.130	$2,u$	0	1	0	1	1	9	1	1	13	28
		$2,u$	0	1	0	1	−1	9	3	1	13	29
8 855.5	1.106	$1,g$	1	2	0	3	1	0	0	3	14	68
8 860.7	1.113	$0,g^+$	0	0	2	4	0	0	0	2	14	70
8 861.8	1.124	$1,g$	0	0	1	8	2	1	−1	1	14	42
		$1,g$	0	0	1	8	0	1	1	1	14	31
8 863.5	1.113	$2,g$	0	0	2	4	2	0	0	2	14	71
8 865.6	1.128	$1,u$	0	1	0	8	4	3	−3	1	14	41
		$1,u$	0	1	0	8	−2	3	3	1	14	31
8 867.0	1.114	$0,u^+$	1	0	1	4	0	0	0	2	14	37
		$0,u^+$	1	1	0	5	1	1	−1	2	14	40
8 869.0	1.128	$1,g$	0	1	0	7	3	4	−2	1	14	29
8 869.0	1.130	$0,u^-$	1	0	0	1	−1	7	1	1	13	56
		$0,u^-$	0	1	0	1	−1	9	1	1	13	44
8 870.9	1.114	$2,u$	1	0	1	4	2	0	0	2	14	39
		$2,u$	1	1	0	5	3	1	−1	2	14	30
8 871.1	1.116	$0,g^-$	0	1	1	5	−1	1	1	2	14	95
8 876.9	1.116	$2,g$	0	1	1	5	1	1	1	2	14	75
8 878.0	1.118	$0,u^+$	0	2	0	5	3	3	−3	2	14	54
		$0,u^+$	0	2	0	5	1	3	−1	2	14	34
8 881.4	1.130	$2,u$	1	0	0	1	1	7	1	1	13	26
		$2,u$	1	0	0	1	−1	7	3	1	13	30
8 883.5	1.118	$2,u$	0	2	0	5	3	3	−1	2	14	38
		$2,u$	0	2	0	5	−1	3	3	2	14	43
8 884.6	1.143	$1,u$	0	0	0	2	2	11	−1	0	13	49
		$1,u$	0	0	0	2	−2	11	3	0	13	51
8 890.0	1.130	$0,u^+$	0	0	1	0	0	8	0	1	13	96

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
8 891.4	1.114	$0,u^+$	1	0	1	4	0	0	0	2	14	48
		$0,u^+$	1	1	0	5	1	1	−1	2	14	39
8 893.8	1.114	$2,u$	1	0	1	4	2	0	0	2	14	48
		$2,u$	1	1	0	5	3	1	−1	2	14	30
8 894.2	1.125	$1,u$								1	14	<25
8 897.5	1.124	$1,g$	1	0	0	9	1	0	0	1	14	66
8 903.5	1.142	$1,g$	0	0	0	3	1	10	0	0	13	41
		$1,g$	0	0	0	3	−1	10	2	0	13	40
8 903.9	1.130	$2,u$	0	0	1	0	0	8	2	1	13	95
8 904.7	1.127	$1,g$	0	1	0	9	1	2	0	1	14	29
8 904.8	1.128	$1,g$								1	14	<25
8 907.1	1.119	$0,g^+$	0	2	0	4	2	4	−2	2	14	41
8 912.9	1.116	$0,u^-$	1	1	0	5	−1	1	1	2	14	67
8 918.1	1.116	$2,u$	1	1	0	5	1	1	1	2	14	44
		$2,u$	0	1	1	4	4	2	−2	2	14	30
8 918.2	1.106	$1,g$	0	2	1	2	2	1	−1	3	14	67
8 920.1	1.128	$1,u$	0	1	0	8	2	3	−1	1	14	27
		$1,u$	0	1	0	8	−2	3	3	1	14	37
8 920.7	1.116	$2,u$	1	1	0	5	3	1	−1	2	14	27
8 921.1	1.119	$2,g$	0	2	0	4	4	4	−2	2	14	35
		$2,g$	0	2	0	4	2	4	0	2	14	32
8 922.3	1.116	$0,u^+$	0	1	1	4	2	2	−2	2	14	36
8 922.7	1.124	$1,g$	0	0	1	8	2	1	−1	1	14	37
		$1,g$	0	0	1	8	0	1	1	1	14	60
8 923.2	1.132	$0,g^+$	1	0	0	0	0	8	0	1	13	38
		$0,g^+$	0	1	0	0	0	10	0	1	13	62
8 925.2	1.120	$0,g^-$	0	2	0	4	−4	4	4	2	14	69
8 926.7	1.118	$0,u^-$	0	2	0	5	−1	3	1	2	14	73
8 930.5	1.110	$1,u$	0	3	0	2	2	3	−1	3	14	34
		$1,u$	0	3	0	2	0	3	1	3	14	37
8 930.8	1.129	$1,u$								1	14	<25
8 933.8	1.118	$2,u$	0	2	0	5	1	3	1	2	14	50
8 933.8	1.125	$1,u$	1	0	0	8	2	1	−1	1	14	26
8 937.2	1.132	$2,g$	1	0	0	0	0	8	2	1	13	38
		$2,g$	0	1	0	0	0	10	2	1	13	62
8 937.9	1.126	$1,g$								1	14	<25
8 939.0	1.107	$1,g$	0	2	1	2	2	1	−1	3	14	25
		$1,g$	0	2	1	2	0	1	1	3	14	73
8 940.3	1.144	$1,g$	0	0	0	1	1	12	0	0	13	50
		$1,g$	0	0	0	1	−1	12	2	0	13	50
8 945.4	1.118	$0,g^+$	0	2	0	4	4	4	−4	2	14	50
8 946.7	1.125	$1,u$	0	0	1	7	3	2	−2	1	14	26
		$1,u$	0	0	1	7	−1	2	2	1	14	42
8 947.1	1.116	$0,u^-$	0	1	1	4	−2	2	2	2	14	62
8 948.6	1.128	$1,g$	0	1	0	7	−3	4	4	1	14	33
8 949.3	1.137	$0,u^+$	0	0	0	11	3	3	−3	0	14	30
		$0,u^+$	0	0	0	11	1	3	−1	0	14	70
8 949.5	1.137	$2,u$	0	0	0	11	5	3	−3	0	14	32
		$2,u$	0	0	0	11	3	3	−1	0	14	40
8 950.2	1.110	$1,u$	0	3	0	2	2	3	−1	3	14	34
		$1,u$	0	3	0	2	−2	3	3	3	14	57
8 951.0	1.115	$2,u$	0	0	2	3	3	1	−1	2	14	44
		$2,u$	0	1	1	4	4	2	−2	2	14	27
8 951.7	1.114	$0,u^+$	0	0	2	3	1	1	−1	2	14	63
8 951.8	1.117	$2,g$								2	14	<25
8 952.0	1.116	$2,u$	0	1	1	4	2	2	0	2	14	33
8 952.5	1.116	$0,g^+$	1	0	1	3	1	1	−1	2	14	36
8 953.8	1.138	$2,g$	0	0	0	10	6	4	−4	0	14	28
		$2,g$	0	0	0	10	4	4	−2	0	14	36
8 954.0	1.097	$0,u^+$	0	3	1	0	0	0	0	4	14	99
8 955.2	1.117	$2,g$	0	2	0	4	4	4	−2	2	14	31
8 955.3	1.138	$0,g^+$	0	0	0	10	2	4	−2	0	14	49
		$0,g^+$	0	0	0	10	0	4	0	0	14	32
8 955.4	1.136	$0,g^+$	0	0	0	12	2	2	−2	0	14	53

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,g^+$	0	0	0	12	0	2	0	0	14	47
8 955.9	1.130	$0,g^+$	1	0	0	0	0	8	0	1	13	62
		$0,g^+$	0	1	0	0	0	10	0	1	13	38
8 956.1	1.129	$1,u$	0	1	0	6	6	5	−5	1	14	39
8 956.8	1.136	$2,g$	0	0	0	12	4	2	−2	0	14	42
		$2,g$	0	0	0	12	2	2	0	0	14	43
8 960.7	1.143	$1,u$	0	0	0	2	0	11	1	0	13	53
8 962.6	1.104	$1,g$	0	1	2	1	1	0	0	3	14	81
8 967.6	1.106	$1,u$	1	2	0	2	2	1	−1	3	14	50
8 969.2	1.130	$2,g$	1	0	0	0	0	8	2	1	13	62
		$2,g$	0	1	0	0	0	10	2	1	13	38
8 969.7	1.138	$2,u$	0	0	0	9	7	5	−5	0	14	30
		$2,u$	0	0	0	9	5	5	−3	0	14	33
8 970.9	1.114	$0,u^-$	0	0	2	3	−1	1	1	2	14	71
8 973.4	1.138	$0,u^+$	0	0	0	9	3	5	−3	0	14	35
		$0,u^+$	0	0	0	9	1	5	−1	0	14	52
8 973.4	1.135	$0,u^+$	0	0	0	13	1	1	−1	0	14	100
8 975.8	1.135	$2,u$	0	0	0	13	3	1	−1	0	14	62
		$2,u$	0	0	0	13	1	1	1	0	14	38
8 976.5	1.117	$0,g^-$	1	1	0	4	−2	2	2	2	14	34
8 976.7	1.114	$2,u$	0	0	2	3	1	1	1	2	14	61
8 976.9	1.109	$1,u$	0	3	0	2	0	3	1	3	14	44
8 977.2	1.125	$1,u$	1	0	0	8	0	1	1	1	14	38
8 978.4	1.115	$0,g^+$	1	0	1	3	1	1	−1	2	14	35
		$0,g^+$	1	1	0	4	2	2	−2	2	14	32
8 978.9	1.115	$2,g$	1	1	0	4	4	2	−2	2	14	48
8 978.9	1.126	$1,g$	0	0	1	6	4	3	−3	1	14	42
8 979.7	1.116	$0,u^+$	0	1	1	4	2	2	−2	2	14	41
		$0,u^+$	0	1	1	4	0	2	0	2	14	56
8 983.1	1.100	$0,g^+$	0	4	0	0	0	2	0	4	14	94
8 983.6	1.126	$1,g$	1	0	0	7	3	2	−2	1	14	40
8 983.8	1.116	$2,g$								2	14	<25
8 986.7	1.127	$1,u$	0	1	0	8	2	3	−1	1	14	27
		$1,u$	0	1	0	8	0	3	1	1	14	36
8 986.8	1.117	$0,g^-$	1	0	1	3	−1	1	1	2	14	33
		$0,g^-$	0	2	0	4	−2	4	2	2	14	44
8 987.3	1.129	$1,u$	0	1	0	6	−4	5	5	1	14	30
8 987.8	1.116	$2,u$	0	1	1	4	2	2	0	2	14	34
		$2,u$	0	1	1	4	0	2	2	2	14	57
8 992.2	1.105	$1,u$	1	1	1	1	1	0	0	3	14	54
		$1,u$	1	2	0	2	2	1	−1	3	14	29
8 992.7	1.118	$2,g$	0	2	0	4	−2	4	4	2	14	29
8 993.7	1.106	$1,u$	1	1	1	1	1	0	0	3	14	28
		$1,u$	1	2	0	2	0	1	1	3	14	53
8 995.8	1.127	$1,u$								1	14	<25
8 997.7	1.139	$2,g$	0	0	0	8	8	6	−6	0	14	40
		$2,g$	0	0	0	8	6	6	−4	0	14	29
8 998.4	1.100	$2,g$	0	4	0	0	0	2	2	4	14	100
9 001.0	1.128	$1,g$	0	1	0	7	3	4	−2	1	14	32
9 003.4	1.134	$0,g^+$	0	0	0	14	0	0	0	0	14	100
9 003.4	1.115	$0,g^-$	1	0	1	3	−1	1	1	2	14	43
		$0,g^-$	1	1	0	4	−2	2	2	2	14	45
9 004.0	1.139	$0,g^+$	0	0	0	8	4	6	−4	0	14	26
		$0,g^+$	0	0	0	8	2	6	−2	0	14	40
9 005.0	1.125	$1,u$	0	0	1	7	1	2	0	1	14	51
		$1,u$	0	0	1	7	−1	2	2	1	14	33
9 006.6	1.134	$2,g$	0	0	0	14	2	0	0	0	14	100
9 006.6	1.115	$2,g$								2	14	<25
9 006.6	1.138	$0,g^-$	0	0	0	10	−4	4	4	0	14	61
		$0,g^-$	0	0	0	10	−2	4	2	0	14	39
9 008.1	1.138	$2,g$	0	0	0	10	6	4	−4	0	14	39
		$2,g$	0	0	0	10	0	4	2	0	14	30
9 009.0	1.096	$0,g^+$	1	3	0	0	0	0	0	4	14	93
9 011.2	1.137	$0,u^-$	0	0	0	11	−3	3	3	0	14	80

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 013.1	1.130	1,*g*								1	14	<25
9 013.8	1.137	2,*u*	0	0	0	11	5	3	−3	0	14	43
		2,*u*	0	0	0	11	1	3	1	0	14	28
		2,*u*	0	0	0	11	−1	3	3	0	14	29
9 014.0	1.114	$0,g^+$	2	0	0	4	0	0	0	2	14	42
9 014.1	1.138	2,*u*	0	0	0	9	7	5	−5	0	14	38
9 014.4	1.138	$0,u^-$	0	0	0	9	−5	5	5	0	14	48
		$0,u^-$	0	0	0	9	−3	5	3	0	14	44
9 015.4	1.126	1,*g*	1	0	0	7	−1	2	2	1	14	31
9 017.6	1.144	1,*g*	0	0	0	1	1	12	0	0	13	50
		1,*g*	0	0	0	1	−1	12	2	0	13	50
9 019.0	1.116	$0,g^+$								2	14	<25
9 019.3	1.120	$0,u^+$	0	2	0	3	3	5	−3	2	14	28
		$0,u^+$	0	2	0	3	1	5	−1	2	14	52
9 020.2	1.112	2,*g*	2	0	0	4	2	0	0	2	14	64
9 021.7	1.116	$0,g^+$								2	14	<25
9 024.4	1.127	1,*u*								1	14	<25
9 028.0	1.136	$0,g^-$	0	0	0	12	−2	2	2	0	14	100
9 029.1	1.117	2,*g*	1	1	0	4	0	2	2	2	14	34
9 030.1	1.117	$0,g^-$	0	1	1	3	−3	3	3	2	14	58
9 031.0	1.126	1,*g*	0	0	1	6	−2	3	3	1	14	37
9 031.4	1.136	2,*g*	0	0	0	12	4	2	−2	0	14	45
		2,*g*	0	0	0	12	0	2	2	0	14	49
9 031.4	1.139	2,*g*	0	0	0	8	8	6	−6	0	14	36
9 032.5	1.128	1,*u*								1	14	<25
9 035.2	1.139	$0,g^-$	0	0	0	8	−6	6	6	0	14	42
		$0,g^-$	0	0	0	8	−4	6	4	0	14	42
9 035.5	1.117	2,*g*	0	1	1	3	3	3	−1	2	14	36
9 035.6	1.118	$0,g^+$	0	2	0	4	2	4	−2	2	14	26
		$0,g^+$	0	2	0	4	0	4	0	2	14	35
9 036.1	1.120	2,*u*	0	2	0	3	1	5	1	2	14	31
9 040.3	1.130	1,*g*								1	14	<25
9 040.6	1.127	1,*u*	0	0	1	5	5	4	−4	1	14	27
9 043.7	1.118	2,*g*	0	2	0	4	0	4	2	2	14	35
9 046.9	1.120	$0,u^-$	0	2	0	3	−3	5	3	2	14	65
9 047.8	1.140	$0,u^+$	0	0	0	7	3	7	−3	0	14	31
		$0,u^+$	0	0	0	7	1	7	−1	0	14	39
9 049.0	1.115	$0,u^+$	1	0	1	2	2	2	−2	2	14	30
9 051.4	1.115	$0,g^+$	0	0	2	2	2	2	−2	2	14	45
		$0,g^+$	0	1	1	3	1	3	−1	2	14	28
9 054.9	1.117	$0,g^+$	0	1	1	3	3	3	−3	2	14	44
9 055.5	1.107	1,*u*	0	2	1	1	1	2	0	3	14	43
		1,*u*	0	2	1	1	−1	2	2	3	14	46
9 056.6	1.140	2,*u*	0	0	0	7	5	7	−3	0	14	29
9 056.6	1.126	1,*g*	1	0	0	7	1	2	0	1	14	30
9 056.9	1.135	$0,u^-$	0	0	0	13	−1	1	1	0	14	100
9 060.9	1.135	2,*u*	0	0	0	13	3	1	−1	0	14	38
		2,*u*	0	0	0	13	1	1	1	0	14	62
9 062.2	1.115	$0,g^-$	0	0	2	2	−2	2	2	2	14	64
9 062.5	1.118	2,*u*	0	2	0	3	−3	5	5	2	14	29
9 062.6	1.127	1,*u*	1	0	0	6	−2	3	3	1	14	26
		1,*u*	0	0	1	5	5	4	−4	1	14	27
9 062.7	1.117	2,*g*	0	1	1	3	3	3	−1	2	14	33
		2,*g*	0	1	1	3	−1	3	3	2	14	29
9 062.7	1.138	$0,u^+$	0	0	0	9	5	5	−5	0	14	69
		$0,u^+$	0	0	0	9	1	5	−1	0	14	29
9 065.2	1.127	1,*g*								1	14	<25
9 066.1	1.138	2,*u*	0	0	0	9	−3	5	5	0	14	26
9 066.4	1.138	$0,g^+$	0	0	0	10	4	4	−4	0	14	73
9 067.8	1.118	2,*u*	0	2	0	3	3	5	−1	2	14	26
9 068.1	1.115	2,*g*	0	0	2	2	2	2	0	2	14	54
9 068.2	1.127	1,*u*	0	0	1	5	−3	4	4	1	14	25
9 068.3	1.129	1,*g*	0	1	0	5	−5	6	6	1	14	30
9 068.4	1.128	1,*g*	0	1	0	7	1	4	0	1	14	25

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 069.5	1.116	$0,u^-$	1	0	1	2	−2	2	2	2	14	54
9 070.1	1.140	$0,u^-$	0	0	0	7	−7	7	7	0	14	44
		$0,u^-$	0	0	0	7	−5	7	5	0	14	36
9 070.3	1.138	$2,g$	0	0	0	10	−2	4	4	0	14	37
9 071.6	1.139	$0,g^+$	0	0	0	8	6	6	−6	0	14	66
9 073.4	1.108	$1,u$	0	2	1	1	1	2	0	3	14	52
		$1,u$	0	2	1	1	−1	2	2	3	14	45
9 074.1	1.139	$2,g$	0	0	0	8	−2	6	4	0	14	25
9 074.4	1.145	$1,u$	0	0	0	0	0	13	1	0	13	100
9 075.6	1.110	$1,g$	0	3	0	1	1	4	0	3	14	43
		$1,g$	0	3	0	1	−1	4	2	3	14	41
9 078.2	1.116	$0,u^+$	1	1	0	3	3	3	−3	2	14	38
9 080.8	1.119	$0,u^+$	0	2	0	3	3	5	−3	2	14	43
9 080.8	1.115	$0,g^+$	0	0	2	2	2	2	−2	2	14	26
		$0,g^+$	0	0	2	2	0	2	0	2	14	46
9 081.6	1.129	$1,u$	0	1	0	6	−2	5	3	1	14	29
9 082.3	1.137	$0,u^+$	0	0	0	11	3	3	−3	0	14	70
		$0,u^+$	0	0	0	11	1	3	−1	0	14	30
9 086.7	1.137	$2,u$	0	0	0	11	3	3	−1	0	14	32
		$2,u$	0	0	0	11	−1	3	3	0	14	45
9 087.0	1.126	$1,g$	0	0	1	6	2	3	−1	1	14	28
		$1,g$	0	0	1	6	0	3	1	1	14	48
9 087.8	1.117	$0,g^-$	0	1	1	3	−1	3	1	2	14	86
9 089.5	1.115	$2,g$	0	0	2	2	0	2	2	2	14	49
9 089.8	1.127	$1,g$	1	0	0	5	5	4	−4	1	14	36
9 091.9	1.117	$2,u$								2	14	<25
9 093.2	1.140	$0,u^+$	0	0	0	7	7	7	−7	0	14	67
9 093.3	1.116	$0,u^-$	1	0	1	2	−2	2	2	2	14	35
		$0,u^-$	1	1	0	3	−3	3	3	2	14	52
9 093.5	1.116	$2,u$	1	1	0	3	3	3	−1	2	14	36
9 093.8	1.140	$2,u$	0	0	0	7	7	7	−5	0	14	32
9 096.5	1.116	$0,u^+$	1	0	1	2	2	2	−2	2	14	32
9 096.9	1.127	$1,u$	1	0	0	6	−2	3	3	1	14	27
9 098.3	1.117	$2,g$	0	1	1	3	1	3	1	2	14	43
		$2,g$	0	1	1	3	−1	3	3	2	14	41
9 101.1	1.105	$1,u$	0	1	2	0	0	1	1	3	14	82
9 101.8	1.117	$2,u$	1	0	1	2	0	2	2	2	14	27
9 104.5	1.108	$1,g$	1	2	0	1	1	2	0	3	14	39
		$1,g$	0	3	0	1	−1	4	2	3	14	34
9 105.3	1.129	$1,g$								1	14	<25
9 106.0	1.109	$1,g$	1	2	0	1	−1	2	2	3	14	36
		$1,g$	0	3	0	1	1	4	0	3	14	41
9 106.9	1.131	$1,u$								1	14	<25
9 108.8	1.141	$0,g^+$	0	0	0	6	4	8	−4	0	14	26
		$0,g^+$	0	0	0	6	2	8	−2	0	14	40
9 109.5	1.114	$0,u^+$	2	0	0	3	1	1	−1	2	14	63
9 110.3	1.136	$0,g^+$	0	0	0	12	2	2	−2	0	14	47
		$0,g^+$	0	0	0	12	0	2	0	0	14	53
9 111.9	1.114	$2,u$	2	0	0	3	3	1	−1	2	14	43
		$2,u$	1	0	1	2	2	2	0	2	14	31
9 114.8	1.127	$1,u$								1	14	<25
9 114.8	1.116	$0,u^+$	1	0	1	2	0	2	0	2	14	30
		$0,u^+$	1	1	0	3	3	3	−3	2	14	28
9 115.1	1.136	$2,g$	0	0	0	12	2	2	0	0	14	50
		$2,g$	0	0	0	12	0	2	2	0	14	37
9 117.5	1.139	$0,g^-$	0	0	0	8	−6	6	6	0	14	52
		$0,g^-$	0	0	0	8	−2	6	2	0	14	35
9 120.4	1.128	$1,g$								1	14	<25
9 120.8	1.138	$0,u^-$	0	0	0	9	−5	5	5	0	14	49
		$0,u^-$	0	0	0	9	−3	5	3	0	14	30
9 121.0	1.116	$2,u$	1	1	0	3	−1	3	3	2	14	31
9 121.9	1.104	$1,g$	2	1	0	1	1	0	0	3	14	55
9 122.5	1.116	$0,u^-$	2	0	0	3	−1	1	1	2	14	31
		$0,u^-$	1	1	0	3	−1	3	1	2	14	32

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 123.0	1.141	2,*g*	0	0	0	6	4	8	−2	0	14	26
		2,*g*	0	0	0	6	2	8	0	0	14	26
9 123.6	1.139	2,*g*	0	0	0	8	6	6	−4	0	14	27
		2,*g*	0	0	0	8	−4	6	6	0	14	35
9 126.0	1.140	0,u^-	0	0	0	7	−7	7	7	0	14	50
		0,u^-	0	0	0	7	−3	7	3	0	14	34
9 126.4	1.138	2,*u*	0	0	0	9	5	5	−3	0	14	30
		2,*u*	0	0	0	9	−3	5	5	0	14	38
9 126.7	1.128	1,*g*								1	14	<25
9 129.6	1.116	0,u^-	2	0	0	3	−1	1	1	2	14	48
		0,u^-	0	2	0	3	−1	5	1	2	14	25
9 129.8	1.107	1,*g*	1	2	0	1	1	2	0	3	14	48
9 132.3	1.115	2,*u*	2	0	0	3	1	1	1	2	14	32
9 134.0	1.140	2,*u*	0	0	0	7	−5	7	7	0	14	28
9 135.7	1.127	1,*u*	1	0	0	6	0	3	1	1	14	28
9 136.1	1.105	1,*g*	1	1	1	0	0	1	1	3	14	52
9 136.1	1.138	0,g^-	0	0	0	10	−4	4	4	0	14	39
		0,g^-	0	0	0	10	−2	4	2	0	14	61
9 136.5	1.118	0,u^+	0	1	1	2	2	4	−2	2	14	42
		0,u^+	0	1	1	2	0	4	0	2	14	28
9 139.2	1.116	2,*u*	2	0	0	3	1	1	1	2	14	27
9 140.0	1.141	0,g^-	0	0	0	6	−6	8	6	0	14	42
		0,g^-	0	0	0	6	−4	8	4	0	14	42
9 141.7	1.138	2,*g*	0	0	0	10	4	4	−2	0	14	33
		2,*g*	0	0	0	10	−2	4	4	0	14	35
9 141.8	1.131	1,*u*	0	1	0	4	−4	7	5	1	14	28
9 144.4	1.120	0,g^+	0	2	0	2	2	6	−2	2	14	39
		0,g^+	0	2	0	2	0	6	0	2	14	31
9 145.7	1.128	1,*g*	0	0	1	4	4	5	−3	1	14	28
9 145.8	1.118	0,u^-	1	1	0	3	−1	3	1	2	14	35
		0,u^-	0	2	0	3	−1	5	1	2	14	38
9 150.0	1.128	1,*u*	0	1	0	6	0	5	1	1	14	29
9 151.0	1.128	1,*g*								1	14	<25
9 151.9	1.118	2,*u*	0	1	1	2	0	4	2	2	14	27
9 155.0	1.128	1,*u*								1	14	<25
9 155.4	1.118	2,*u*	1	1	0	3	1	3	1	2	14	26
9 159.8	1.141	2,*g*								0	14	<25
9 160.7	1.120	2,*g*	0	2	0	2	0	6	2	2	14	32
9 161.1	1.118	0,u^-	0	1	1	2	−2	4	2	2	14	70
9 162.5	1.129	1,*g*								1	14	<25
9 163.5	1.137	0,u^-	0	0	0	11	−1	3	1	0	14	80
9 168.8	1.127	1,*u*	0	0	1	5	1	4	0	1	14	41
		1,*u*	0	0	1	5	−1	4	2	1	14	36
9 169.2	1.137	2,*u*	0	0	0	11	3	3	−1	0	14	28
		2,*u*	0	0	0	11	1	3	1	0	14	48
9 169.5	1.116	0,g^+	1	0	1	1	1	3	−1	2	14	44
9 170.5	1.116	0,u^+	0	0	2	1	1	3	−1	2	14	69
9 170.8	1.140	0,u^+	0	0	0	7	5	7	−5	0	14	50
9 173.3	1.118	2,*u*	0	1	1	2	2	4	0	2	14	37
		2,*u*	0	1	1	2	−2	4	4	2	14	33
9 174.5	1.139	0,g^+	0	0	0	8	4	6	−4	0	14	56
9 176.4	1.141	0,g^+	0	0	0	6	6	8	−6	0	14	66
9 177.8	1.128	1,*g*								1	14	<25
9 179.8	1.108	0,g^+	0	3	0	6	0	0	0	3	15	98
9 180.2	1.140	2,*u*	0	0	0	7	−5	7	7	0	14	38
9 180.6	1.128	1,*u*	1	0	0	4	4	5	−3	1	14	31
9 181.6	1.120	0,g^-	1	1	0	2	−2	4	2	2	14	27
		0,g^-	0	2	0	2	−2	6	2	2	14	60
9 181.9	1.139	2,*g*	0	0	0	8	−4	6	6	0	14	32
9 182.7	1.130	1,*u*	0	1	0	4	4	7	−3	1	14	29
9 183.0	1.142	0,u^+	0	0	0	5	3	9	−3	0	14	35
		0,u^+	0	0	0	5	1	9	−1	0	14	52
9 183.6	1.108	2,*g*	0	3	0	6	2	0	0	3	15	98
9 185.7	1.116	2,*g*	1	0	1	1	1	3	1	2	14	29

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 186.2	1.116	2,u	0	0	2	1	1	3	1	2	14	45
9 189.6	1.138	0,u^+	0	0	0	9	3	5	−3	0	14	63
9 190.2	1.116	0,u^-	0	0	2	1	−1	3	1	2	14	74
9 193.4	1.141	2,g	0	0	0	6	−6	8	8	0	14	45
9 195.4	1.118	0,u^+	0	1	1	2	2	4	−2	2	14	41
		0,u^+	0	1	1	2	0	4	0	2	14	56
9 196.4	1.138	2,u	0	0	0	9	3	5	−1	0	14	29
		2,u	0	0	0	9	−1	5	3	0	14	27
9 196.8	1.120	2,g	0	2	0	2	2	6	0	2	14	29
		2,g	0	2	0	2	−2	6	4	2	14	34
9 198.0	1.128	1,g	0	0	1	4	−2	5	3	1	14	31
9 198.6	1.142	2,u	0	0	0	5	1	9	1	0	14	28
9 198.7	1.117	0,g^+	1	1	0	2	2	4	−2	2	14	37
		0,g^+	1	1	0	2	0	4	0	2	14	26
9 200.2	1.116	0,g^-	2	0	0	2	−2	2	2	2	14	27
		0,g^-	1	0	1	1	−1	3	1	2	14	34
		0,g^-	0	2	0	2	−2	6	2	2	14	27
9 201.6	1.116	2,u	0	0	2	1	1	3	1	2	14	25
		2,u	0	0	2	1	−1	3	3	2	14	33
9 206.7	1.108	1,g	0	2	1	0	0	3	1	3	14	98
9 208.4	1.118	2,u	0	1	1	2	0	4	2	2	14	45
9 208.9	1.128	1,u	1	0	0	4	−4	5	5	1	14	30
9 212.7	1.114	0,g^+	2	0	0	2	2	2	−2	2	14	48
		0,g^+	1	0	1	1	1	3	−1	2	14	28
9 212.8	1.132	1,g	0	1	0	3	1	8	0	1	14	27
		1,g	0	1	0	3	−1	8	2	1	14	25
9 213.0	1.117	2,g								2	14	<25
9 214.5	1.128	1,g								1	14	<25
9 215.8	1.117	2,g	1	0	1	1	−1	3	3	2	14	45
9 216.6	1.138	0,g^+	0	0	0	10	2	4	−2	0	14	49
		0,g^+	0	0	0	10	0	4	0	0	14	43
9 221.9	1.129	1,u								1	14	<25
9 222.4	1.141	0,g^-	0	0	0	6	−6	8	6	0	14	52
		0,g^-	0	0	0	6	−2	8	2	0	14	35
9 222.6	1.116	0,g^-	2	0	0	2	−2	2	2	2	14	40
		0,g^-	1	1	0	2	−2	4	2	2	14	45
9 223.1	1.138	2,g	0	0	0	10	2	4	0	0	14	38
		2,g	0	0	0	10	0	4	2	0	14	38
9 224.0	1.142	0,u^-	0	0	0	5	−5	9	5	0	14	48
		0,u^-	0	0	0	5	−3	9	3	0	14	44
9 225.4	1.115	0,g^-	1	0	1	1	−1	3	1	2	14	59
9 226.7	1.118	0,g^+								2	14	<25
9 227.3	1.140	0,u^-	0	0	0	7	−5	7	5	0	14	51
9 231.1	1.129	1,u								1	14	<25
9 231.2	1.117	1,g	0	2	0	9	1	0	0	2	15	94
9 231.5	1.129	1,g	0	1	0	5	1	6	0	1	14	26
9 232.7	1.114	2,g	2	0	0	2	2	2	0	2	14	35
		2,g	1	0	1	1	1	3	1	2	14	33
9 232.8	1.111	1,u	0	3	0	0	0	5	1	3	14	74
9 235.2	1.141	2,g	0	0	0	6	−6	8	8	0	14	29
9 236.1	1.117	2,g	1	1	0	2	−2	4	4	2	14	41
9 236.7	1.140	2,u	0	0	0	7	5	7	−3	0	14	26
9 238.3	1.116	0,g^+	2	0	0	2	0	2	0	2	14	43
9 239.4	1.119	2,g								2	14	<25
9 240.6	1.099	1,g	0	4	0	3	1	0	0	4	15	100
9 240.8	1.142	2,u	0	0	0	5	−3	9	5	0	14	27
9 242.6	1.139	0,g^-	0	0	0	8	−4	6	4	0	14	44
		0,g^-	0	0	0	8	−2	6	2	0	14	50
9 244.1	1.129	1,u	0	0	1	3	−3	6	4	1	14	34
9 250.3	1.128	1,g	0	0	1	4	0	5	1	1	14	46
9 250.6	1.116	2,g	2	0	0	2	0	2	2	2	14	38
9 250.6	1.139	2,g	0	0	0	8	4	6	−2	0	14	28
		2,g	0	0	0	8	−2	6	4	0	14	33
9 256.6	1.130	1,g								1	14	<25

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 256.8	1.118	$0,g^+$	1	1	0	2	2	4	−2	2	14	26
		$0,g^+$	1	1	0	2	0	4	0	2	14	26
9 257.3	1.106	$1,u$	2	1	0	0	0	1	1	3	14	48
		$1,u$	1	2	0	0	0	3	1	3	14	28
9 257.7	1.131	$1,g$	0	1	0	3	3	8	−2	1	14	30
9 257.9	1.129	$1,u$	1	0	0	4	−2	5	3	1	14	26
9 267.1	1.118	$2,g$	1	1	0	2	0	4	2	2	14	29
9 267.3	1.119	$0,g^+$	0	1	1	1	1	5	−1	2	14	75
9 269.4	1.138	$0,u^-$	0	0	0	9	−3	5	3	0	14	25
		$0,u^-$	0	0	0	9	−1	5	1	0	14	72
9 269.4	1.109	$0,u^+$	0	3	0	5	1	1	−1	3	15	97
9 269.7	1.143	$0,g^+$	0	0	0	4	2	10	−2	0	14	49
		$0,g^+$	0	0	0	4	0	10	0	0	14	32
9 271.8	1.109	$2,u$	0	3	0	5	3	1	−1	3	15	72
		$2,u$	0	3	0	5	1	1	1	3	15	25
9 272.2	1.106	$1,u$	2	1	0	0	0	1	1	3	14	39
		$1,u$	1	2	0	0	0	3	1	3	14	48
9 272.4	1.142	$0,u^+$	0	0	0	5	5	9	−5	0	14	69
		$0,u^+$	0	0	0	5	1	9	−1	0	14	29
9 276.8	1.138	$2,u$	0	0	0	9	1	5	1	0	14	41
		$2,u$	0	0	0	9	−1	5	3	0	14	27
9 277.8	1.118	$1,u$	0	2	0	8	2	1	−1	2	15	55
		$1,u$	0	2	0	8	0	1	1	2	15	39
9 279.3	1.141	$0,g^+$	0	0	0	6	4	8	−4	0	14	56
9 280.6	1.129	$1,u$	0	0	1	3	−3	6	4	1	14	26
9 281.5	1.119	$2,g$	0	1	1	1	1	5	1	2	14	40
		$2,g$	0	1	1	1	−1	5	3	2	14	38
9 281.9	1.121	$0,u^+$	1	1	0	1	1	5	−1	2	14	27
		$0,u^+$	0	2	0	1	1	7	−1	2	14	61
9 285.2	1.143	$2,g$	0	0	0	4	2	10	0	0	14	28
		$2,g$	0	0	0	4	0	10	2	0	14	32
9 287.0	1.142	$2,u$	0	0	0	5	5	9	−3	0	14	30
		$2,u$	0	0	0	5	−5	9	7	0	14	40
9 290.5	1.141	$2,g$	0	0	0	6	−4	8	6	0	14	32
9 292.7	1.129	$1,g$	1	0	0	3	3	6	−2	1	14	28
		$1,g$	1	0	0	3	−3	6	4	1	14	33
9 292.8	1.129	$1,u$								1	14	<25
9 295.2	1.140	$0,u^+$	0	0	0	7	3	7	−3	0	14	60
9 297.2	1.121	$2,u$	0	2	0	1	1	7	1	2	14	32
		$2,u$	0	2	0	1	−1	7	3	2	14	31
9 299.5	1.117	$0,g^+$	0	0	2	0	0	4	0	2	14	77
9 302.5	1.119	$0,g^-$	0	1	1	1	−1	5	1	2	14	97
9 304.5	1.140	$2,u$	0	0	0	7	3	7	−1	0	14	29
		$2,u$	0	0	0	7	−3	7	5	0	14	29
9 305.1	1.117	$0,u^+$	2	0	0	1	1	3	−1	2	14	28
		$0,u^+$	1	0	1	0	0	4	0	2	14	32
		$0,u^+$	0	2	0	1	1	7	−1	2	14	26
9 307.2	1.109	$0,u^-$	0	3	0	5	−1	1	1	3	15	98
9 308.9	1.131	$1,g$								1	14	<25
9 311.8	1.117	$2,g$	0	0	2	0	0	4	2	2	14	55
		$2,g$	0	1	1	1	1	5	1	2	14	33
9 312.4	1.109	$2,u$	0	3	0	5	3	1	−1	3	15	26
		$2,u$	0	3	0	5	1	1	1	3	15	73
9 312.9	1.130	$1,u$	0	1	0	4	0	7	1	1	14	26
9 316.9	1.118	$2,g$	0	1	1	1	−1	5	3	2	14	50
9 319.9	1.117	$2,u$	1	0	1	0	0	4	2	2	14	35
9 321.0	1.143	$0,g^-$	0	0	0	4	−4	10	4	0	14	61
		$0,g^-$	0	0	0	4	−2	10	2	0	14	39
9 322.1	1.139	$0,g^+$	0	0	0	8	2	6	−2	0	14	49
		$0,g^+$	0	0	0	8	0	6	0	0	14	40
9 325.4	1.130	$1,g$	0	0	1	2	0	7	1	1	14	35
9 329.7	1.120	$0,u^-$	1	1	0	1	−1	5	1	2	14	38
		$0,u^-$	0	2	0	1	−1	7	1	2	14	50
9 330.4	1.139	$2,g$	0	0	0	8	2	6	0	0	14	32

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		2,*g*	0	0	0	8	0	6	2	0	14	38
9 330.4	1.142	0,u^-	0	0	0	5	−5	9	5	0	14	49
		0,u^-	0	0	0	5	−3	9	3	0	14	30
9 330.9	1.132	1,*u*	0	1	0	2	0	9	1	1	14	34
9 331.6	1.129	1,*u*	0	0	1	3	1	6	0	1	14	41
		1,*u*	0	0	1	3	−1	6	2	1	14	39
9 332.2	1.118	0,u^+	1	1	0	1	1	5	−1	2	14	62
9 334.0	1.118	1,*u*	0	2	0	8	2	1	−1	2	15	40
		1,*u*	0	2	0	8	0	1	1	2	15	56
9 335.8	1.119	1,*g*	0	2	0	7	3	2	−2	2	15	36
		1,*g*	0	2	0	7	1	2	0	2	15	40
9 336.2	1.143	2,*g*	0	0	0	4	4	10	−2	0	14	30
		2,*g*	0	0	0	4	−4	10	6	0	14	31
9 338.0	1.130	1,*g*								1	14	<25
9 339.1	1.115	0,u^+	2	0	0	1	1	3	−1	2	14	48
		0,u^+	1	0	1	0	0	4	0	2	14	46
9 343.1	1.142	2,*u*	0	0	0	5	−5	9	7	0	14	25
9 343.4	1.120	2,*u*	0	2	0	1	−1	7	3	2	14	29
9 345.9	1.118	2,*u*	1	1	0	1	1	5	1	2	14	27
		2,*u*	1	1	0	1	−1	5	3	2	14	36
9 347.2	1.117	0,u^-	2	0	0	1	−1	3	1	2	14	63
		0,u^-	0	2	0	1	−1	7	1	2	14	27
9 347.4	1.141	0,g^-	0	0	0	6	−4	8	4	0	14	44
		0,g^-	0	0	0	6	−2	8	2	0	14	50
9 352.6	1.115	2,*u*	2	0	0	1	−1	3	3	2	14	43
		2,*u*	1	0	1	0	0	4	2	2	14	38
9 357.9	1.141	2,*g*	0	0	0	6	−2	8	4	0	14	30
9 360.2	1.117	2,*u*	2	0	0	1	1	3	1	2	14	39
9 362.5	1.130	1,*g*	0	0	1	2	2	7	−1	1	14	37
		1,*g*	0	0	1	2	−2	7	3	1	14	42
9 368.1	1.119	0,u^-	1	1	0	1	−1	5	1	2	14	60
9 368.5	1.144	0,u^+	0	0	0	3	3	11	−3	0	14	30
		0,u^+	0	0	0	3	1	11	−1	0	14	70
9 370.8	1.130	1,*g*								1	14	<25
9 370.9	1.110	0,g^+	0	3	0	4	2	2	−2	3	15	55
		0,g^+	0	3	0	4	0	2	0	3	15	41
9 371.3	1.110	2,*g*	0	3	0	4	4	2	−2	3	15	68
9 371.9	1.130	1,*u*	1	0	0	2	0	7	1	1	14	32
9 372.9	1.100	1,*u*	0	4	0	2	2	1	−1	4	15	73
		1,*u*	0	4	0	2	0	1	1	4	15	26
9 374.6	1.140	0,u^-	0	0	0	7	−3	7	3	0	14	27
		0,u^-	0	0	0	7	−1	7	1	0	14	70
9 379.0	1.116	1,*u*	0	1	1	7	1	0	0	2	15	92
9 379.6	1.119	2,*u*	1	1	0	1	1	5	1	2	14	29
		2,*u*	1	1	0	1	−1	5	3	2	14	31
9 380.8	1.143	0,g^+	0	0	0	4	4	10	−4	0	14	73
9 381.4	1.119	1,*g*	0	2	0	7	3	2	−2	2	15	44
		1,*g*	0	2	0	7	−1	2	2	2	15	47
9 383.6	1.144	2,*u*	0	0	0	3	1	11	1	0	14	36
		2,*u*	0	0	0	3	−1	11	3	0	14	33
9 383.7	1.140	2,*u*	0	0	0	7	1	7	1	0	14	38
		2,*u*	0	0	0	7	−1	7	3	0	14	31
9 385.4	1.132	1,*u*	0	1	0	2	2	9	−1	1	14	33
		1,*u*	0	1	0	2	−2	9	3	1	14	33
9 389.8	1.107	0,u^+	0	2	1	4	0	0	0	3	15	97
9 393.4	1.100	1,*u*	0	4	0	2	2	1	−1	4	15	26
		1,*u*	0	4	0	2	0	1	1	4	15	74
9 393.6	1.107	2,*u*	0	2	1	4	2	0	0	3	15	97
9 394.3	1.130	1,*g*								1	14	<25
9 394.5	1.143	2,*g*	0	0	0	4	4	10	−2	0	14	34
		2,*g*	0	0	0	4	−4	10	6	0	14	40
9 394.9	1.126	0,g^+	0	1	0	12	0	0	0	1	15	87
9 397.7	1.110	0,g^-	0	3	0	4	−2	2	2	3	15	98
9 398.5	1.126	2,*g*	0	1	0	12	2	0	0	1	15	87

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 399.2	1.142	$0,u^+$	0	0	0	5	3	9	−3	0	14	63
9 399.4	1.127	$0,u^+$	0	1	0	11	1	1	−1	1	15	89
9 401.7	1.110	$2,g$	0	3	0	4	4	2	−2	3	15	26
		$2,g$	0	3	0	4	2	2	0	3	15	31
		$2,g$	0	3	0	4	0	2	2	3	15	39
9 402.2	1.127	$2,u$	0	1	0	11	3	1	−1	1	15	57
		$2,u$	0	1	0	11	1	1	1	1	15	33
9 405.5	1.120	$1,u$	0	2	0	6	4	3	−3	2	15	29
		$1,u$	0	2	0	6	2	3	−1	2	15	34
9 408.8	1.091	$0,g^+$	0	5	0	0	0	0	0	5	15	100
9 409.3	1.120	$0,u^+$	0	1	1	0	0	6	0	2	14	96
9 410.7	1.142	$2,u$	0	0	0	5	3	9	−1	0	14	31
		$2,u$	0	0	0	5	−3	9	5	0	14	32
9 412.7	1.130	$1,g$	0	0	1	2	0	7	1	1	14	53
9 415.0	1.115	$1,g$	1	1	0	7	1	0	0	2	15	54
9 415.3	1.128	$0,g^+$	0	1	0	10	2	2	−2	1	15	48
		$0,g^+$	0	1	0	10	0	2	0	1	15	42
9 417.1	1.128	$2,g$	0	1	0	10	4	2	−2	1	15	40
		$2,g$	0	1	0	10	2	2	0	1	15	38
9 418.5	1.130	$1,u$	1	0	0	2	2	7	−1	1	14	31
		$1,u$	1	0	0	2	−2	7	3	1	14	35
9 423.0	1.120	$2,u$	0	1	1	0	0	6	2	2	14	96
9 426.9	1.141	$0,g^+$	0	0	0	6	2	8	−2	0	14	49
		$0,g^+$	0	0	0	6	0	8	0	0	14	40
9 430.4	1.144	$0,u^-$	0	0	0	3	−3	11	3	0	14	80
9 430.7	1.109	$0,g^+$	1	2	0	4	0	0	0	3	15	35
		$0,g^+$	0	3	0	4	2	2	−2	3	15	32
		$0,g^+$	0	3	0	4	0	2	0	3	15	30
9 432.2	1.121	$0,g^+$	1	1	0	0	0	6	0	2	14	36
		$0,g^+$	0	2	0	0	0	8	0	2	14	57
9 436.1	1.119	$1,g$	0	2	0	7	1	2	0	2	15	53
		$1,g$	0	2	0	7	−1	2	2	2	15	28
9 436.9	1.141	$2,g$	0	0	0	6	2	8	0	0	14	28
		$2,g$	0	0	0	6	0	8	2	0	14	39
9 436.9	1.108	$2,g$	1	2	0	4	2	0	0	3	15	54
		$2,g$	0	3	0	4	0	2	2	3	15	29
9 438.8	1.108	$0,g^+$	1	2	0	4	0	0	0	3	15	56
		$0,g^+$	0	3	0	4	0	2	0	3	15	28
9 440.6	1.120	$1,u$	0	2	0	6	4	3	−3	2	15	41
		$1,u$	0	2	0	6	−2	3	3	2	15	30
9 442.5	1.129	$0,u^+$	0	1	0	9	3	3	−3	1	15	28
		$0,u^+$	0	1	0	9	1	3	−1	1	15	62
9 442.9	1.129	$2,u$	0	1	0	9	5	3	−3	1	15	33
		$2,u$	0	1	0	9	3	3	−1	1	15	35
9 443.6	1.108	$2,g$	1	2	0	4	2	0	0	3	15	38
		$2,g$	0	3	0	4	2	2	0	3	15	32
9 443.7	1.131	$1,u$	0	0	1	1	1	8	0	1	14	40
		$1,u$	0	0	1	1	−1	8	2	1	14	41
9 444.7	1.144	$2,u$	0	0	0	3	3	11	−1	0	14	39
		$2,u$	0	0	0	3	−3	11	5	0	14	41
9 446.6	1.121	$2,g$	1	1	0	0	0	6	2	2	14	35
		$2,g$	0	2	0	0	0	8	2	2	14	58
9 448.5	1.131	$1,u$	1	0	0	2	0	7	1	1	14	28
		$1,u$	0	1	0	2	0	9	1	1	14	29
9 449.4	1.116	$1,g$	1	1	0	7	1	0	0	2	15	33
		$1,g$	0	1	1	6	2	1	−1	2	15	35
9 450.5	1.143	$0,g^-$	0	0	0	4	−4	10	4	0	14	39
		$0,g^-$	0	0	0	4	−2	10	2	0	14	61
9 456.1	1.118	$0,g^+$	2	0	0	0	0	4	0	2	14	58
		$0,g^+$	0	2	0	0	0	8	0	2	14	26
9 461.0	1.133	$1,g$	0	1	0	1	1	10	0	1	14	34
		$1,g$	0	1	0	1	−1	10	2	1	14	34
9 462.9	1.143	$2,g$	0	0	0	4	2	10	0	0	14	29
		$2,g$	0	0	0	4	−2	10	4	0	14	32

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 469.0	1.115	1,u	1	0	1	5	1	0	0	2	15	30
9 469.4	1.114	1,g	0	0	2	5	1	0	0	2	15	72
9 469.9	1.118	2,g	2	0	0	0	0	4	2	2	14	59
9 471.9	1.127	0,u^-	0	1	0	11	−1	1	1	1	15	90
9 475.8	1.131	1,u	1	0	0	2	0	7	1	1	14	29
		1,u	0	1	0	2	0	9	1	1	14	25
9 476.3	1.127	2,u	0	1	0	11	3	1	−1	1	15	34
		2,u	0	1	0	11	1	1	1	1	15	56
9 477.1	1.128	0,g^-	0	1	0	10	−2	2	2	1	15	91
9 478.9	1.119	0,g^+	1	1	0	0	0	6	0	2	14	56
9 479.0	1.142	0,u^-	0	0	0	5	−3	9	3	0	14	25
		0,u^-	0	0	0	5	−1	9	1	0	14	72
9 479.4	1.145	0,g^+	0	0	0	2	2	12	−2	0	14	53
		0,g^+	0	0	0	2	0	12	0	0	14	47
9 480.1	1.129	2,g	0	1	0	8	6	4	−4	1	15	31
		2,g	0	1	0	8	4	4	−2	1	15	31
9 480.8	1.128	2,g	0	1	0	10	4	2	−2	1	15	40
		2,g	0	1	0	10	0	2	2	1	15	42
9 481.3	1.129	0,g^+	0	1	0	8	2	4	−2	1	15	43
		0,g^+	0	1	0	8	0	4	0	1	15	28
9 483.8	1.117	1,g	0	1	1	6	2	1	−1	2	15	34
		1,g	0	1	1	6	0	1	1	2	15	59
9 484.2	1.120	1,u	0	2	0	6	2	3	−1	2	15	30
		1,u	0	2	0	6	−2	3	3	2	15	37
9 484.9	1.111	0,u^+	0	3	0	3	3	3	−3	3	15	38
		0,u^+	0	3	0	3	1	3	−1	3	15	56
9 487.5	1.120	1,g	0	2	0	5	5	4	−4	2	15	29
		1,g	0	2	0	5	3	4	−2	2	15	28
9 487.8	1.125	0,u^+	0	0	1	10	0	0	0	1	15	97
9 489.8	1.142	2,u	0	0	0	5	1	9	1	0	14	38
		2,u	0	0	0	5	−1	9	3	0	14	34
9 491.0	1.125	2,u	0	0	1	10	2	0	0	1	15	97
9 491.6	1.119	2,g	1	1	0	0	0	6	2	2	14	56
9 493.6	1.131	1,u	0	0	1	1	1	8	0	1	14	47
		1,u	0	0	1	1	−1	8	2	1	14	48
9 494.0	1.145	2,g	0	0	0	2	2	12	0	0	14	28
		2,g	0	0	0	2	0	12	2	0	14	47
		2,g	0	0	0	2	−2	12	4	0	14	25
9 494.0	1.129	0,u^-	0	1	0	9	−3	3	3	1	15	74
9 494.4	1.107	0,g^+	0	2	1	3	1	1	−1	3	15	84
9 495.6	1.107	2,g	0	2	1	3	3	1	−1	3	15	74
9 496.7	1.129	2,u	0	1	0	9	5	3	−3	1	15	39
		2,u	0	1	0	9	1	3	1	1	15	27
9 496.8	1.115	1,u	1	0	1	5	1	0	0	2	15	55
9 499.3	1.131	1,g	1	0	0	1	1	8	0	1	14	34
		1,g	1	0	0	1	−1	8	2	1	14	34
9 500.2	1.125	0,g^+	0	0	1	9	1	1	−1	1	15	81
9 500.9	1.111	0,u^-	0	3	0	3	−3	3	3	3	15	85
9 501.0	1.111	2,u	0	3	0	3	3	3	−1	3	15	48
		2,u	0	3	0	3	1	3	1	3	15	33
9 501.5	1.144	0,u^+	0	0	0	3	3	11	−3	0	14	70
		0,u^+	0	0	0	3	1	11	−1	0	14	30
9 502.8	1.125	2,g	0	0	1	9	3	1	−1	1	15	53
		2,g	0	0	1	9	1	1	1	1	15	29
9 511.7	1.121	1,g	0	2	0	5	5	4	−4	2	15	41
9 512.6	1.098	1,u	0	3	1	1	1	0	0	4	15	99
9 514.6	1.144	2,u	0	0	0	3	3	11	−1	0	14	34
		2,u	0	0	0	3	−3	11	5	0	14	36
9 519.1	1.108	0,g^-	0	2	1	3	−1	1	1	3	15	97
9 519.2	1.117	1,u	1	1	0	6	0	1	1	2	15	29
		1,u	0	1	1	5	3	2	−2	2	15	34
9 521.8	1.116	1,u	1	1	0	6	2	1	−1	2	15	39
9 522.6	1.111	0,u^+	0	3	0	3	3	3	−3	3	15	57
		0,u^+	0	3	0	3	1	3	−1	3	15	31

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 522.6	1.130	$0,g^-$	0	1	0	8	−4	4	4	1	15	58
		$0,g^-$	0	1	0	8	−2	4	2	1	15	33
9 522.8	1.126	$0,u^+$	1	0	0	9	1	1	−1	1	15	26
		$0,u^+$	0	0	1	8	2	2	−2	1	15	33
		$0,u^+$	0	0	1	8	0	2	0	1	15	29
9 523.8	1.129	$2,g$	0	1	0	8	6	4	−4	1	15	38
		$2,g$	0	1	0	8	0	4	2	1	15	25
9 524.6	1.126	$2,u$	0	0	1	8	4	2	−2	1	15	29
		$2,u$	0	0	1	8	2	2	0	1	15	26
9 525.4	1.108	$2,g$	0	2	1	3	1	1	1	3	15	80
9 525.8	1.132	$1,g$	0	1	0	1	1	10	0	1	14	29
		$1,g$	0	1	0	1	−1	10	2	1	14	29
9 526.7	1.101	$1,g$	0	4	0	1	1	2	0	4	15	52
		$1,g$	0	4	0	1	−1	2	2	4	15	45
9 529.5	1.130	$2,u$	0	1	0	7	7	5	−5	1	15	37
		$2,u$	0	1	0	7	5	5	−3	1	15	26
9 530.7	1.111	$2,u$	0	3	0	3	3	3	−1	3	15	27
		$2,u$	0	3	0	3	−1	3	3	3	15	49
9 531.0	1.143	$0,g^+$	0	0	0	4	2	10	−2	0	14	49
		$0,g^+$	0	0	0	4	0	10	0	0	14	43
9 532.5	1.130	$0,u^+$	0	1	0	7	3	5	−3	1	15	31
		$0,u^+$	0	1	0	7	1	5	−1	1	15	43
9 538.1	1.120	$1,u$	0	2	0	6	2	3	−1	2	15	28
		$1,u$	0	2	0	6	0	3	1	2	15	46
9 538.4	1.117	$1,g$								2	15	<25
9 538.4	1.107	$0,u^+$	1	2	0	3	1	1	−1	3	15	65
9 538.8	1.105	$0,g^+$	0	1	2	2	0	0	0	3	15	78
9 541.2	1.107	$2,u$	1	2	0	3	3	1	−1	3	15	54
9 542.5	1.143	$2,g$	0	0	0	4	2	10	0	0	14	26
		$2,g$	0	0	0	4	0	10	2	0	14	43
9 542.6	1.105	$2,g$	0	1	2	2	2	0	0	3	15	79
9 543.8	1.125	$0,g^+$	1	0	0	10	0	0	0	1	15	63
9 544.5	1.101	$1,g$	0	4	0	1	1	2	0	4	15	42
		$1,g$	0	4	0	1	−1	2	2	4	15	54
9 545.2	1.119	$1,g$								2	15	<25
9 545.9	1.124	$2,g$	1	0	0	10	2	0	0	1	15	71
9 549.1	1.115	$1,u$	0	0	2	4	2	1	−1	2	15	42
9 549.2	1.127	$0,g^+$	0	1	0	10	2	2	−2	1	15	36
		$0,g^+$	0	1	0	10	0	2	0	1	15	40
9 552.0	1.145	$0,g^-$	0	0	0	2	−2	12	2	0	14	100
9 552.8	1.117	$1,u$								2	15	<25
9 553.6	1.129	$0,u^+$	0	1	0	9	3	3	−3	1	15	60
		$0,u^+$	0	1	0	9	1	3	−1	1	15	30
9 553.9	1.128	$2,g$	0	1	0	10	2	2	0	1	15	43
		$2,g$	0	1	0	10	0	2	2	1	15	32
9 555.3	1.110	$0,u^-$	1	2	0	3	−1	1	1	3	15	27
		$0,u^-$	0	3	0	3	−1	3	1	3	15	60
9 556.5	1.127	$0,g^+$	0	0	1	7	1	3	−1	1	15	33
9 557.4	1.132	$1,g$	1	0	0	1	1	8	0	1	14	28
		$1,g$	1	0	0	1	−1	8	2	1	14	30
9 557.8	1.127	$2,g$								1	15	<25
9 558.4	1.128	$2,u$	0	1	0	9	3	3	−1	1	15	31
		$2,u$	0	1	0	9	−1	3	3	1	15	40
9 561.9	1.130	$2,u$	0	1	0	7	7	5	−5	1	15	36
9 563.7	1.130	$0,u^-$	0	1	0	7	−5	5	5	1	15	48
		$0,u^-$	0	1	0	7	−3	5	3	1	15	37
9 564.2	1.097	$1,g$	1	3	0	1	1	0	0	4	15	93
9 564.3	1.109	$2,u$	0	3	0	3	1	3	1	3	15	28
		$2,u$	0	3	0	3	−1	3	3	3	15	30
9 564.5	1.125	$0,g^-$	0	0	1	9	−1	1	1	1	15	97
9 565.7	1.145	$2,g$	0	0	0	2	2	12	0	0	14	49
		$2,g$	0	0	0	2	−2	12	4	0	14	51
9 566.3	1.105	$0,u^+$	1	1	1	2	0	0	0	3	15	75
9 567.1	1.126	$2,u$	1	0	0	9	3	1	−1	1	15	33

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		2,u	0	0	1	8	4	2	−2	1	15	28
9 568.1	1.125	0,u^+	1	0	0	9	1	1	−1	1	15	62
9 569.6	1.125	2,g	0	0	1	9	3	1	−1	1	15	28
		2,g	0	0	1	9	1	1	1	1	15	66
9 569.8	1.105	2,u	1	1	1	2	2	0	0	3	15	77
9 570.9	1.108	0,u^-	1	2	0	3	−1	1	1	3	15	67
		0,u^-	0	3	0	3	−1	3	1	3	15	28
9 571.4	1.130	0,g^+	0	1	0	8	4	4	−4	1	15	63
9 571.7	1.116	1,g	1	1	0	5	3	2	−2	2	15	28
9 574.3	1.132	1,g	0	0	1	0	0	9	1	1	14	96
9 574.9	1.115	1,u	0	0	2	4	0	1	1	2	15	48
9 575.6	1.129	2,g	0	1	0	8	−2	4	4	1	15	32
9 575.8	1.117	1,g								2	15	<25
9 576.9	1.108	2,u	1	2	0	3	1	1	1	3	15	52
9 578.7	1.126	0,u^-	0	0	1	8	−2	2	2	1	15	81
9 582.7	1.144	0,u^-	0	0	0	3	−1	11	1	0	14	80
9 583.9	1.126	2,u	0	0	1	8	0	2	2	1	15	42
9 587.1	1.119	1,g	0	2	0	5	3	4	−2	2	15	28
9 588.1	1.117	1,u	0	1	1	5	1	2	0	2	15	49
		1,u	0	1	1	5	−1	2	2	2	15	36
9 589.7	1.121	1,u	0	2	0	4	2	5	−1	2	15	25
9 594.9	1.144	2,u	0	0	0	3	1	11	1	0	14	41
		2,u	0	0	0	3	−1	11	3	0	14	39
9 596.4	1.131	0,g^+	0	1	0	6	2	6	−2	1	15	34
9 598.3	1.127	2,g	0	0	1	7	5	3	−3	1	15	44
9 598.8	1.129	0,u^+	0	1	0	7	5	5	−5	1	15	52
9 599.2	1.139	1,g	0	0	0	11	3	4	−2	0	15	31
		1,g	0	0	0	11	1	4	0	0	15	31
9 600.7	1.117	1,g	0	1	1	4	4	3	−3	2	15	34
9 601.3	1.129	2,u								1	15	<25
9 602.2	1.146	0,u^+	0	0	0	1	1	13	−1	0	14	100
9 603.2	1.133	1,u	1	0	0	0	0	9	1	1	14	37
		1,u	0	1	0	0	0	11	1	1	14	63
9 603.3	1.116	1,g	1	0	1	4	0	1	1	2	15	30
9 603.4	1.127	0,g^-	1	0	0	8	−2	2	2	1	15	28
		0,g^-	0	0	1	7	−3	3	3	1	15	49
9 604.2	1.128	0,u^+								1	15	<25
9 604.3	1.126	0,g^+	1	0	0	8	2	2	−2	1	15	27
		0,g^+	0	0	1	7	1	3	−1	1	15	29
9 604.9	1.138	1,u	0	0	0	12	2	3	−1	0	15	39
		1,u	0	0	0	12	0	3	1	0	15	30
9 605.1	1.104	0,u^+	2	0	1	0	0	0	0	3	15	31
		0,u^+	0	0	3	0	0	0	0	3	15	53
9 605.5	1.140	1,u	0	0	0	10	4	5	−3	0	15	26
		1,u	0	0	0	10	2	5	−1	0	15	28
9 605.5	1.129	2,u								1	15	<25
9 607.0	1.131	2,g	0	1	0	6	4	6	−2	1	15	26
9 609.8	1.127	2,g	1	0	0	8	4	2	−2	1	15	33
		2,g	0	0	1	7	1	3	1	1	15	25
9 611.5	1.108	0,u^+	0	2	1	2	2	2	−2	3	15	49
		0,u^+	0	2	1	2	0	2	0	3	15	27
9 615.0	1.121	1,u	0	2	0	4	−4	5	5	2	15	34
9 616.2	1.104	0,g^+	1	0	2	0	0	0	0	3	15	80
9 616.3	1.146	2,u	0	0	0	1	1	13	1	0	14	50
		2,u	0	0	0	1	−1	13	3	0	14	50
9 617.6	1.126	0,u^-	1	0	0	9	−1	1	1	1	15	60
9 618.6	1.111	0,g^+	0	3	0	2	2	4	−2	3	15	46
		0,g^+	0	3	0	2	0	4	0	3	15	34
9 618.8	1.131	0,g^-	0	1	0	6	−6	6	6	1	15	46
		0,g^-	0	1	0	6	−4	6	4	1	15	33
9 620.3	1.114	1,g	2	0	0	5	1	0	0	2	15	55
9 621.1	1.125	2,u	1	0	0	9	1	1	1	1	15	48
9 622.6	1.137	1,g	0	0	0	13	3	2	−2	0	15	33
		1,g	0	0	0	13	1	2	0	0	15	46

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 623.6	1.117	1,g	1	1	0	5	−1	2	2	2	15	28
9 623.6	1.108	0,u^-	0	2	1	2	−2	2	2	3	15	86
9 623.9	1.140	1,g	0	0	0	9	3	6	−2	0	15	25
9 626.2	1.128	0,u^-	0	1	0	9	−1	3	1	1	15	58
9 627.1	1.117	1,u								2	15	<25
9 627.3	1.117	1,g								2	15	<25
9 629.0	1.129	0,g^-	0	1	0	8	−4	4	4	1	15	28
		0,g^-	0	1	0	8	−2	4	2	1	15	57
9 630.0	1.108	2,u	0	2	1	2	2	2	0	3	15	61
		2,u	0	2	1	2	0	2	2	3	15	27
9 631.3	1.128	2,u	0	1	0	9	1	3	1	1	15	39
9 634.3	1.145	0,g^+	0	0	0	2	2	12	−2	0	14	47
		0,g^+	0	0	0	2	0	12	0	0	14	53
9 635.0	1.129	2,g	0	1	0	8	4	4	−2	1	15	25
		2,g	0	1	0	8	−2	4	4	1	15	29
9 635.5	1.112	2,g	0	3	0	2	2	4	0	3	15	35
		2,g	0	3	0	2	0	4	2	3	15	37
9 637.5	1.116	1,g	0	0	2	3	3	2	−2	2	15	39
9 638.4	1.128	2,u	0	0	1	6	6	4	−4	1	15	50
9 638.7	1.128	0,u^-	1	0	0	7	−3	3	3	1	15	35
9 639.1	1.132	1,u	1	0	0	0	0	9	1	1	14	63
		1,u	0	1	0	0	0	11	1	1	14	37
9 640.9	1.120	1,g	0	2	0	5	1	4	0	2	15	35
		1,g	0	2	0	5	−1	4	2	2	15	25
9 641.1	1.126	0,u^+	0	0	1	8	2	2	−2	1	15	44
		0,u^+	0	0	1	8	0	2	0	1	15	54
9 641.6	1.120	1,u	0	2	0	4	−4	5	5	2	15	38
9 641.7	1.131	0,g^+	0	1	0	6	6	6	−6	1	15	66
9 643.3	1.131	2,g	0	1	0	6	6	6	−4	1	15	29
9 644.0	1.126	0,g^-	1	0	0	8	−2	2	2	1	15	60
9 644.6	1.111	0,g^-	0	3	0	2	−2	4	2	3	15	84
9 644.8	1.127	2,g	1	0	0	8	0	2	2	1	15	31
9 646.9	1.128	2,u	1	0	0	7	5	3	−3	1	15	40
9 647.1	1.145	2,g	0	0	0	2	0	12	2	0	14	53
9 647.7	1.109	0,u^+	0	2	1	2	2	2	−2	3	15	33
		0,u^+	0	2	1	2	0	2	0	3	15	65
9 647.9	1.126	2,u	0	0	1	8	2	2	0	1	15	41
		2,u	0	0	1	8	0	2	2	1	15	40
9 648.4	1.130	0,u^-	0	1	0	7	−5	5	5	1	15	26
		0,u^-	0	1	0	7	−3	5	3	1	15	35
9 652.1	1.136	1,u	0	0	0	14	2	1	−1	0	15	56
		1,u	0	0	0	14	0	1	1	0	15	44
9 653.1	1.128	0,u^+	1	0	0	7	1	3	−1	1	15	26
		0,u^+	0	0	1	6	2	4	−2	1	15	26
9 653.2	1.140	1,u	0	0	0	10	6	5	−5	0	15	32
		1,u	0	0	0	10	−2	5	3	0	15	25
9 654.4	1.118	1,u								2	15	<25
9 654.6	1.130	2,u	0	1	0	7	−3	5	5	1	15	26
9 654.9	1.117	1,g	0	0	2	3	−1	2	2	2	15	27
9 655.3	1.107	0,g^+	1	2	0	2	2	2	−2	3	15	38
9 655.4	1.141	1,u								0	15	<25
9 656.7	1.109	2,u	0	2	1	2	2	2	0	3	15	34
		2,u	0	2	1	2	0	2	2	3	15	62
9 656.7	1.117	1,g	0	1	1	4	−2	3	3	2	15	27
9 656.8	1.127	0,g^+	0	0	1	7	3	3	−3	1	15	54
		0,g^+	0	0	1	7	1	3	−1	1	15	28
9 657.2	1.139	1,g	0	0	0	11	5	4	−4	0	15	36
		1,g	0	0	0	11	−1	4	2	0	15	27
9 659.8	1.111	2,g	0	3	0	2	2	4	0	3	15	26
		2,g	0	3	0	2	−2	4	4	3	15	59
9 659.9	1.117	1,u								2	15	<25
9 661.3	1.128	0,g^+	1	0	0	6	2	4	−2	1	15	29
9 661.6	1.140	1,g	0	0	0	9	7	6	−6	0	15	31
9 661.6	1.106	0,u^+	0	1	2	1	1	1	−1	3	15	75

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 662.4	1.128	2,*g*	1	0	0	6	6	4	−4	1	15	35
9 664.3	1.127	2,*g*	0	0	1	7	−1	3	3	1	15	43
9 668.6	1.099	1,*g*	0	3	1	0	0	1	1	4	15	99
9 670.3	1.106	0,u^-	0	1	2	1	−1	1	1	3	15	80
9 672.8	1.108	0,g^-	1	2	0	2	−2	2	2	3	15	68
9 673.4	1.138	1,*u*	0	0	0	12	4	3	−3	0	15	42
		1,*u*	0	0	0	12	−2	3	3	0	15	35
9 673.9	1.131	0,g^-	0	1	0	6	−6	6	6	1	15	44
9 674.3	1.108	2,*g*	1	2	0	2	2	2	0	3	15	32
9 677.5	1.132	0,u^+	0	1	0	5	3	7	−3	1	15	29
		0,u^+	0	1	0	5	1	7	−1	1	15	41
9 677.7	1.128	2,*u*								1	15	<25
9 677.8	1.119	1,*u*								2	15	<25
9 678.2	1.106	2,*u*	0	1	2	1	1	1	1	3	15	79
9 678.4	1.110	0,g^+	0	3	0	2	2	4	−2	3	15	28
		0,g^+	0	3	0	2	0	4	0	3	15	39
9 679.8	1.127	0,u^-	1	0	0	7	−3	3	3	1	15	39
		0,u^-	0	0	1	6	−4	4	4	1	15	34
9 680.1	1.116	1,*g*	0	0	2	3	1	2	0	2	15	36
		1,*g*	0	0	2	3	−1	2	2	2	15	29
9 681.1	1.117	1,*u*								2	15	<25
9 682.0	1.131	2,*g*	0	1	0	6	−4	6	6	1	15	31
9 682.5	1.141	1,*u*	0	0	0	8	8	7	−7	0	15	38
9 683.4	1.128	0,u^+	0	0	1	6	4	4	−4	1	15	39
9 684.3	1.106	0,g^+	1	1	1	1	1	1	−1	3	15	42
9 685.7	1.146	0,u^-	0	0	0	1	−1	13	1	0	14	100
9 690.3	1.110	2,*g*	0	3	0	2	0	4	2	3	15	36
9 691.1	1.118	1,*u*								2	15	<25
9 691.2	1.127	0,g^+	1	0	0	8	2	2	−2	1	15	26
		0,g^+	1	0	0	8	0	2	0	1	15	33
9 691.3	1.129	0,g^-	1	0	0	6	−4	4	4	1	15	37
9 691.8	1.118	1,*g*	0	1	1	4	0	3	1	2	15	51
9 692.2	1.128	2,*u*								1	15	<25
9 692.7	1.102	1,*u*	0	4	0	0	0	3	1	4	15	90
9 692.8	1.132	2,*u*								1	15	<25
9 693.5	1.135	1,*g*	0	0	0	15	1	0	0	0	15	100
9 693.6	1.129	2,*g*	1	0	0	6	6	4	−4	1	15	31
9 695.3	1.106	2,*g*	2	1	0	2	2	0	0	3	15	47
9 696.3	1.127	2,*g*	1	0	0	8	2	2	0	1	15	30
		2,*g*	1	0	0	8	0	2	2	1	15	31
9 698.2	1.106	0,g^+	2	1	0	2	0	0	0	3	15	32
9 699.0	1.146	2,*u*	0	0	0	1	1	13	1	0	14	50
		2,*u*	0	0	0	1	−1	13	3	0	14	50
9 699.4	1.106	0,g^-	1	1	1	1	−1	1	1	3	15	81
9 699.6	1.115	1,*u*	2	0	0	4	2	1	−1	2	15	34
9 701.6	1.137	1,*g*	0	0	0	13	3	2	−2	0	15	48
		1,*g*	0	0	0	13	−1	2	2	0	15	50
9 702.8	1.129	0,g^+	0	1	0	8	2	4	−2	1	15	35
		0,g^+	0	1	0	8	0	4	0	1	15	30
9 703.3	1.122	1,*g*	0	2	0	3	1	6	0	2	15	27
9 703.3	1.130	0,u^+	0	1	0	7	3	5	−3	1	15	50
9 704.8	1.107	0,g^+	2	1	0	2	0	0	0	3	15	26
		0,g^+	1	2	0	2	0	2	0	3	15	27
9 705.8	1.140	1,*g*	0	0	0	9	7	6	−6	0	15	30
		1,*g*	0	0	0	9	−5	6	6	0	15	26
9 707.0	1.142	1,*g*								0	15	<25
9 707.5	1.107	2,*g*	1	1	1	1	1	1	1	3	15	33
9 708.5	1.129	2,*g*	0	1	0	8	2	4	0	1	15	30
		2,*g*	0	1	0	8	0	4	2	1	15	30
9 708.5	1.140	1,*u*	0	0	0	10	6	5	−5	0	15	32
		1,*u*	0	0	0	10	−4	5	5	0	15	32
9 708.5	1.132	0,u^-	0	1	0	5	−5	7	5	1	15	44
		0,u^-	0	1	0	5	−3	7	3	1	15	34
9 710.0	1.117	1,*u*	1	0	1	3	1	2	0	2	15	28

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 711.0	1.130	2,*u*	0	1	0	7	3	5	−1	1	15	25
9 711.1	1.118	1,*u*								2	15	<25
9 713.5	1.107	2,*g*	1	1	1	1	1	1	1	3	15	31
		2,*g*	1	2	0	2	0	2	2	3	15	32
9 714.3	1.129	$0,g^+$	0	0	1	5	5	5	−5	1	15	27
9 715.8	1.141	1,*u*	0	0	0	8	8	7	−7	0	15	26
9 716.3	1.130	$0,g^+$	1	0	0	6	4	4	−4	1	15	28
		$0,g^+$	0	1	0	6	4	6	−4	1	15	31
9 717.4	1.127	$0,g^-$	0	0	1	7	−1	3	1	1	15	81
9 719.6	1.128	$0,u^+$	1	0	0	7	3	3	−3	1	15	37
9 722.1	1.129	2,*g*	0	0	1	5	5	5	−3	1	15	29
9 722.5	1.098	1,*u*	1	3	0	0	0	1	1	4	15	90
9 722.9	1.128	2,*u*	1	0	0	7	−1	3	3	1	15	32
9 723.6	1.139	1,*g*	0	0	0	11	5	4	−4	0	15	32
		1,*g*	0	0	0	11	−3	4	4	0	15	39
9 723.6	1.116	1,*u*	2	0	0	4	0	1	1	2	15	29
9 725.7	1.127	2,*g*	0	0	1	7	1	3	1	1	15	45
9 727.0	1.119	1,*u*								2	15	<25
9 727.4	1.130	2,*g*								1	15	<25
9 727.4	1.130	$0,g^+$	0	1	0	6	4	6	−4	1	15	26
9 728.0	1.132	2,*u*								1	15	<25
9 728.7	1.129	$0,g^-$	0	0	1	5	−5	5	5	1	15	49
9 731.6	1.117	1,*u*								2	15	<25
9 733.3	1.129	$0,u^+$	1	0	0	5	3	5	−3	1	15	25
		$0,u^+$	1	0	0	5	1	5	−1	1	15	35
9 734.5	1.118	1,*g*								2	15	<25
9 734.6	1.128	$0,u^-$	0	0	1	6	−4	4	4	1	15	25
		$0,u^-$	0	0	1	6	−2	4	2	1	15	58
9 736.3	1.130	2,*g*								1	15	<25
9 737.0	1.147	$0,g^+$	0	0	0	0	0	14	0	0	14	100
9 737.2	1.121	1,*g*	0	2	0	3	3	6	−2	2	15	31
9 737.8	1.142	1,*g*								0	15	<25
9 741.9	1.136	1,*u*	0	0	0	14	2	1	−1	0	15	44
		1,*u*	0	0	0	14	0	1	1	0	15	56
9 744.0	1.128	2,*u*	0	0	1	6	−2	4	4	1	15	37
9 744.6	1.132	$0,u^+$	0	1	0	5	5	7	−5	1	15	57
9 744.9	1.120	1,*u*	0	2	0	4	0	5	1	2	15	26
9 746.7	1.129	2,*u*								1	15	<25
9 746.8	1.117	1,*u*								2	15	<25
9 750.6	1.147	2,*g*	0	0	0	0	0	14	2	0	14	100
9 750.8	1.138	1,*u*	0	0	0	12	4	3	−3	0	15	29
		1,*u*	0	0	0	12	−2	3	3	0	15	40
9 750.8	1.109	$0,g^+$	0	2	1	1	1	3	−1	3	15	88
9 753.8	1.128	$0,g^+$	1	0	0	6	4	4	−4	1	15	28
		$0,g^+$	0	0	1	5	5	5	−5	1	15	31
9 755.2	1.129	$0,u^-$	1	0	0	5	−5	5	5	1	15	51
		$0,u^-$	1	0	0	5	−3	5	3	1	15	27
9 756.8	1.141	1,*u*	0	0	0	8	−6	7	7	0	15	34
9 757.8	1.119	1,*u*								2	15	<25
9 758.4	1.129	2,*g*	0	0	1	5	5	5	−3	1	15	28
9 758.9	1.140	1,*g*	0	0	0	9	−5	6	6	0	15	34
9 760.4	1.132	2,*u*	0	1	0	5	−5	7	7	1	15	44
9 761.4	1.118	1,*g*	1	0	1	2	−2	3	3	2	15	26
9 762.4	1.129	$0,g^-$								1	15	<25
9 762.6	1.117	1,*u*	0	0	2	2	2	3	−1	2	15	26
		1,*u*	0	0	2	2	−2	3	3	2	15	29
9 764.4	1.112	$0,u^+$	0	3	0	1	1	5	−1	3	15	77
9 764.5	1.128	$0,u^-$	1	0	0	7	−1	3	1	1	15	47
9 765.8	1.109	2,*g*	0	2	1	1	1	3	1	3	15	42
		2,*g*	0	2	1	1	−1	3	3	3	15	46
9 767.7	1.142	1,*g*	0	0	0	7	−7	8	8	0	15	39
9 768.6	1.118	1,*g*								2	15	<25
9 770.2	1.143	1,*u*								0	15	<25
9 771.3	1.128	2,*u*	1	0	0	7	1	3	1	1	15	32

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 771.8	1.133	$0,g^+$	0	1	0	4	2	8	−2	1	15	39
9 773.2	1.140	$1,u$	0	0	0	10	−4	5	5	0	15	33
9 773.3	1.129	$2,g$	0	0	1	5	−3	5	5	1	15	25
9 775.7	1.109	$0,g^-$	0	2	1	1	−1	3	1	3	15	98
9 776.1	1.121	$1,g$								2	15	<25
9 776.8	1.131	$0,g^-$	0	1	0	6	−2	6	2	1	15	44
9 778.0	1.129	$0,u^+$	1	0	0	5	5	5	−5	1	15	62
9 779.2	1.129	$0,u^-$	0	1	0	7	−1	5	1	1	15	48
9 780.3	1.112	$2,u$	0	3	0	1	1	5	1	3	15	43
		$2,u$	0	3	0	1	−1	5	3	3	15	39
9 781.2	1.129	$2,u$	1	0	0	5	5	5	−3	1	15	28
9 782.5	1.109	$1,g$	0	3	0	7	1	0	0	3	16	97
9 784.9	1.117	$1,u$	0	0	2	2	0	3	1	2	15	43
9 785.6	1.130	$2,u$	0	1	0	7	1	5	1	1	15	31
9 786.6	1.104	$0,u^+$	2	0	1	0	0	0	0	3	15	47
		$0,u^+$	0	0	3	0	0	0	0	3	15	30
9 786.8	1.131	$2,g$								1	15	<25
9 787.4	1.109	$2,g$	0	2	1	1	1	3	1	3	15	54
		$2,g$	0	2	1	1	−1	3	3	3	15	41
9 787.9	1.133	$2,g$								1	15	<25
9 788.1	1.117	$1,g$	2	0	0	3	3	2	−2	2	15	26
		$1,g$	1	1	0	3	−3	4	4	2	15	27
9 789.3	1.131	$0,u^-$	0	1	0	5	−5	7	5	1	15	35
9 790.2	1.137	$1,g$	0	0	0	13	1	2	0	0	15	52
		$1,g$	0	0	0	13	−1	2	2	0	15	29
9 791.7	1.116	$1,g$								2	15	<25
9 793.6	1.128	$0,u^+$	0	0	1	6	2	4	−2	1	15	47
		$0,u^+$	0	0	1	6	0	4	0	1	15	46
9 795.0	1.119	$1,u$	0	1	1	3	1	4	0	2	15	40
		$1,u$	0	1	1	3	−1	4	2	2	15	41
9 795.0	1.129	$0,g^-$	1	0	0	6	−2	4	2	1	15	42
9 795.5	1.117	$1,g$								2	15	<25
9 797.8	1.107	$0,u^+$	1	2	0	1	1	3	−1	3	15	41
9 797.9	1.130	$0,u^+$	0	0	1	4	2	6	−2	1	15	31
9 799.7	1.139	$1,g$	0	0	0	11	3	4	−2	0	15	33
		$1,g$	0	0	0	11	−3	4	4	0	15	27
9 800.2	1.107	$0,g^+$	0	1	2	0	0	2	0	3	15	81
9 800.9	1.129	$2,g$	1	0	0	6	−2	4	4	1	15	27
9 800.9	1.111	$0,u^-$	1	2	0	1	−1	3	1	3	15	27
		$0,u^-$	0	3	0	1	−1	5	1	3	15	70
9 801.3	1.131	$2,u$								1	15	<25
9 803.4	1.128	$2,u$	0	0	1	6	2	4	0	1	15	29
		$2,u$	0	0	1	6	0	4	2	1	15	40
9 805.5	1.142	$1,g$	0	0	0	7	−7	8	8	0	15	30
9 808.0	1.141	$1,u$	0	0	0	8	6	7	−5	0	15	26
		$1,u$	0	0	0	8	−6	7	7	0	15	26
9 808.1	1.143	$1,u$								0	15	<25
9 808.4	1.130	$0,u^-$	0	0	1	4	−4	6	4	1	15	30
9 810.9	1.116	$1,g$								2	15	<25
9 811.5	1.130	$2,u$	0	0	1	4	4	6	−2	1	15	25
9 811.9	1.109	$2,u$	1	2	0	1	1	3	1	3	15	34
9 812.0	1.129	$0,g^+$	0	0	1	5	3	5	−3	1	15	55
9 812.3	1.100	$0,g^+$	0	4	0	4	0	0	0	4	16	99
9 812.4	1.133	$0,g^-$	0	1	0	4	−4	8	4	1	15	49
		$0,g^-$	0	1	0	4	−2	8	2	1	15	29
9 814.4	1.107	$2,g$	0	1	2	0	0	2	2	3	15	79
9 815.1	1.111	$2,u$	1	2	0	1	−1	3	3	3	15	26
		$2,u$	0	3	0	1	1	5	1	3	15	42
		$2,u$	0	3	0	1	−1	5	3	3	15	25
9 816.3	1.100	$2,g$	0	4	0	4	2	0	0	4	16	99
9 816.5	1.117	$1,g$	1	0	1	2	0	3	1	2	15	32
9 819.9	1.106	$0,u^+$	2	1	0	1	1	1	−1	3	15	51
		$0,u^+$	1	2	0	1	1	3	−1	3	15	31
9 820.7	1.130	$2,u$								1	15	<25

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 822.1	1.140	1,g	0	0	0	9	5	6	−4	0	15	28
9 822.6	1.107	0,u^-	2	1	0	1	−1	1	1	3	15	55
9 823.1	1.129	2,g	0	0	1	5	−3	5	5	1	15	26
9 823.1	1.130	0,g^+	1	0	0	4	2	6	−2	1	15	35
9 824.4	1.119	1,g								2	15	<25
9 826.0	1.129	0,u^-	1	0	0	5	−3	5	3	1	15	31
		0,u^-	0	0	1	4	−4	6	4	1	15	32
9 828.7	1.133	2,g	0	1	0	4	−4	8	6	1	15	27
9 828.8	1.119	1,g	0	1	1	2	0	5	1	2	15	27
9 829.1	1.122	1,u	0	2	0	2	0	7	1	2	15	30
9 832.3	1.106	0,u^+	1	1	1	0	0	2	0	3	15	76
9 832.8	1.107	2,u	2	1	0	1	1	1	1	3	15	47
		2,u	1	2	0	1	−1	3	3	3	15	28
9 835.0	1.117	1,g	2	0	0	3	1	2	0	2	15	31
9 837.6	1.129	0,g^+	1	0	0	6	2	4	−2	1	15	26
		0,g^+	1	0	0	6	0	4	0	1	15	27
9 837.7	1.108	0,u^-	2	1	0	1	−1	1	1	3	15	30
		0,u^-	1	2	0	1	−1	3	1	3	15	54
9 838.4	1.138	1,u	0	0	0	12	2	3	−1	0	15	34
		1,u	0	0	0	12	0	3	1	0	15	44
9 839.0	1.130	2,g								1	15	<25
9 839.7	1.130	2,u	0	0	1	4	4	6	−2	1	15	26
9 839.9	1.130	0,u^+								1	15	<25
9 841.6	1.109	2,u	1	1	1	0	0	2	2	3	15	31
		2,u	1	2	0	1	1	3	1	3	15	42
9 845.4	1.144	1,g	0	0	0	5	1	10	0	0	15	28
9 846.0	1.129	2,g	1	0	0	6	0	4	2	1	15	28
9 848.2	1.140	1,u	0	0	0	10	4	5	−3	0	15	27
		1,u	0	0	0	10	−2	5	3	0	15	32
9 850.0	1.131	0,u^+	0	0	1	4	4	6	−4	1	15	31
		0,u^+	0	1	0	5	3	7	−3	1	15	33
9 850.4	1.120	1,g								2	15	<25
9 850.4	1.143	1,u	0	0	0	6	6	9	−5	0	15	29
		1,u	0	0	0	6	−6	9	7	0	15	35
9 851.0	1.107	2,u	2	1	0	1	1	1	1	3	15	26
		2,u	1	1	1	0	0	2	2	3	15	39
9 852.0	1.130	2,u								1	15	<25
9 854.7	1.130	0,g^-	1	0	0	4	−4	6	4	1	15	52
		0,g^-	1	0	0	4	−2	6	2	1	15	25
9 855.3	1.130	0,g^+	0	1	0	6	2	6	−2	1	15	31
		0,g^+	0	1	0	6	0	6	0	1	15	26
9 855.8	1.142	1,g	0	0	0	7	−5	8	6	0	15	26
9 857.3	1.118	1,u								2	15	<25
9 859.9	1.132	0,g^+	0	1	0	4	4	8	−4	1	15	53
9 860.0	1.120	1,g	0	1	1	2	2	5	−1	2	15	27
9 860.8	1.110	1,u	0	3	0	6	2	1	−1	3	16	58
		1,u	0	3	0	6	0	1	1	3	16	37
9 861.1	1.118	0,g^+	0	2	0	10	0	0	0	2	16	91
9 862.5	1.130	2,g	0	1	0	6	0	6	2	1	15	26
9 862.8	1.131	2,u								1	15	<25
9 865.0	1.118	2,g	0	2	0	10	2	0	0	2	16	92
9 865.1	1.118	1,g	0	0	2	1	1	4	0	2	15	39
		1,g	0	0	2	1	−1	4	2	2	15	26
9 869.6	1.129	0,g^-	0	0	1	5	−1	5	1	1	15	76
9 870.2	1.130	0,u^+	1	0	0	5	3	5	−3	1	15	37
9 870.4	1.141	1,u	0	0	0	8	−4	7	5	0	15	28
9 871.1	1.130	2,g	1	0	0	4	4	6	−2	1	15	28
9 872.2	1.122	1,u	0	2	0	2	2	7	−1	2	15	28
		1,u	0	2	0	2	−2	7	3	2	15	30
9 874.7	1.132	2,g	0	1	0	4	4	8	−2	1	15	28
9 878.5	1.133	0,u^+	0	1	0	3	1	9	−1	1	15	52
9 878.6	1.130	2,u								1	15	<25
9 880.5	1.129	2,g	0	0	1	5	1	5	1	1	15	39
		2,g	0	0	1	5	−1	5	3	1	15	32

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 886.3	1.139	1,g	0	0	0	11	1	4	0	0	15	41
		1,g	0	0	0	11	−1	4	2	0	15	31
9 887.4	1.131	0,g^+	1	0	0	4	4	6	−4	1	15	31
		0,g^+	0	0	1	3	1	7	−1	1	15	38
9 888.9	1.130	0,u^-	0	0	1	4	−4	6	4	1	15	26
		0,u^-	0	0	1	4	−2	6	2	1	15	60
9 889.2	1.118	1,g	0	0	2	1	1	4	0	2	15	35
		1,g	0	0	2	1	−1	4	2	2	15	37
9 889.8	1.119	1,u	1	1	0	2	0	5	1	2	15	26
9 892.5	1.144	1,g								0	15	<25
9 894.0	1.119	1,u								2	15	<25
9 894.2	1.133	2,u	0	1	0	3	1	9	1	1	15	28
9 896.3	1.140	1,g	0	0	0	9	3	6	−2	0	15	29
		1,g	0	0	0	9	−3	6	4	0	15	29
9 897.2	1.119	0,u^+	0	2	0	9	1	1	−1	2	16	91
9 897.2	1.130	0,g^+								1	15	<25
9 897.5	1.120	1,g	0	1	1	2	0	5	1	2	15	53
9 900.1	1.119	2,u	0	2	0	9	3	1	−1	2	16	60
		2,u	0	2	0	9	1	1	1	2	16	32
9 901.4	1.130	2,u	0	0	1	4	−2	6	4	1	15	34
9 901.9	1.131	2,g								1	15	<25
9 901.9	1.143	1,u	0	0	0	6	6	9	−5	0	15	26
		1,u	0	0	0	6	−6	9	7	0	15	29
9 903.2	1.110	0,u^+	0	2	1	0	0	4	0	3	15	97
9 905.4	1.110	1,u	0	3	0	6	2	1	−1	3	16	38
		1,u	0	3	0	6	0	1	1	3	16	59
9 906.0	1.116	1,u								2	15	<25
9 910.5	1.130	0,u^-	1	0	0	5	−1	5	1	1	15	42
		0,u^-	0	1	0	5	−1	7	1	1	15	30
9 910.8	1.130	2,g								1	15	<25
9 915.0	1.131	0,g^-								1	15	<25
9 916.7	1.110	2,u	0	2	1	0	0	4	2	3	15	97
9 917.8	1.142	1,g	0	0	0	7	5	8	−4	0	15	26
		1,g	0	0	0	7	−5	8	6	0	15	26
9 919.9	1.119	1,u	1	1	0	2	2	5	−1	2	15	25
		1,u	1	1	0	2	−2	5	3	2	15	32
9 920.4	1.130	2,u								1	15	<25
9 922.3	1.111	0,g^+	0	3	0	0	0	6	0	3	15	57
9 922.9	1.117	1,u								2	15	<25
9 923.3	1.120	1,u								2	15	<25
9 923.7	1.131	0,g^-	0	0	1	3	−3	7	3	1	15	61
9 924.8	1.103	0,g^+	3	0	0	0	0	0	0	3	15	76
9 926.3	1.131	0,u^+	1	0	0	3	1	7	−1	1	15	49
9 927.6	1.131	2,g								1	15	<25
9 929.2	1.133	0,u^-	0	1	0	3	−3	9	3	1	15	58
9 931.3	1.131	0,u^-	1	0	0	5	−1	5	1	1	15	29
		0,u^-	0	1	0	5	−1	7	1	1	15	44
9 932.7	1.145	1,u	0	0	0	4	2	11	−1	0	15	26
		1,u	0	0	0	4	0	11	1	0	15	32
9 934.1	1.140	1,u	0	0	0	10	2	5	−1	0	15	30
		1,u	0	0	0	10	0	5	1	0	15	40
9 934.1	1.101	0,u^+	0	4	0	3	1	1	−1	4	16	98
9 936.1	1.101	2,u	0	4	0	3	3	1	−1	4	16	82
9 937.4	1.112	2,g	1	2	0	0	0	4	2	3	15	26
		2,g	0	3	0	0	0	6	2	3	15	72
9 938.3	1.131	2,g	0	0	1	3	−3	7	5	1	15	38
9 938.7	1.118	1,u	2	0	0	2	0	3	1	2	15	39
9 939.5	1.131	2,u	0	1	0	5	1	7	1	1	15	25
9 941.4	1.131	2,u	1	0	0	3	1	7	1	1	15	28
9 944.1	1.141	1,u	0	0	0	8	4	7	−3	0	15	25
		1,u	0	0	0	8	−2	7	3	0	15	26
9 944.4	1.133	2,u	0	1	0	3	3	9	−1	1	15	32
9 944.7	1.120	0,g^+	0	2	0	8	2	2	−2	2	16	49
		0,g^+	0	2	0	8	0	2	0	2	16	42

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
9 945.2	1.131	$0,g^-$	1	0	0	4	−2	6	2	1	15	45
9 945.4	1.130	$0,u^+$	0	0	1	4	2	6	−2	1	15	47
		$0,u^+$	0	0	1	4	0	6	0	1	15	46
9 946.5	1.120	$2,g$	0	2	0	8	4	2	−2	2	16	45
		$2,g$	0	2	0	8	2	2	0	2	16	36
9 946.6	1.144	$1,g$	0	0	0	5	5	10	−4	0	15	33
		$1,g$	0	0	0	5	−5	10	6	0	15	37
9 950.8	1.111	$1,g$	0	3	0	5	3	2	−2	3	16	42
		$1,g$	0	3	0	5	1	2	0	3	16	38
9 951.2	1.108	$0,g^+$	2	1	0	0	0	2	0	3	15	43
		$0,g^+$	1	2	0	0	0	4	0	3	15	27
9 953.3	1.092	$1,g$	0	5	0	1	1	0	0	5	16	100
9 955.5	1.131	$2,g$	1	0	0	4	−2	6	4	1	15	27
9 955.8	1.121	$1,u$	0	1	1	1	−1	6	2	2	15	29
9 957.3	1.130	$2,u$	0	0	1	4	0	6	2	1	15	42
9 958.9	1.119	$0,u^-$	0	2	0	9	−1	1	1	2	16	93
9 959.6	1.101	$0,u^-$	0	4	0	3	−1	1	1	4	16	100
9 962.0	1.120	$1,u$	1	1	0	2	0	5	1	2	15	29
9 963.6	1.119	$2,u$	0	2	0	9	3	1	−1	2	16	33
		$2,u$	0	2	0	9	1	1	1	2	16	60
9 964.5	1.143	$1,u$	0	0	0	6	4	9	−3	0	15	25
		$1,u$	0	0	0	6	−4	9	5	0	15	28
9 965.1	1.108	$2,g$	2	1	0	0	0	2	2	3	15	46
		$2,g$	1	2	0	0	0	4	2	3	15	28
9 965.3	1.131	$0,g^+$	0	0	1	3	3	7	−3	1	15	58
		$0,g^+$	0	0	1	3	1	7	−1	1	15	30
9 965.5	1.101	$2,u$	0	4	0	3	1	1	1	4	16	83
9 967.3	1.123	$1,g$	0	2	0	1	1	8	0	2	15	30
		$1,g$	0	2	0	1	−1	8	2	2	15	30
9 968.5	1.131	$0,u^-$	1	0	0	3	−3	7	3	1	15	59
9 971.5	1.108	$0,g^+$	2	1	0	0	0	2	0	3	15	41
		$0,g^+$	1	2	0	0	0	4	0	3	15	46
9 978.7	1.131	$2,g$	0	0	1	3	−3	7	5	1	15	30
9 981.7	1.140	$1,g$	0	0	0	9	1	6	0	0	15	37
		$1,g$	0	0	0	9	−1	6	2	0	15	32
9 982.8	1.131	$2,u$	1	0	0	3	3	7	−1	1	15	26
		$2,u$	1	0	0	3	−3	7	5	1	15	34
9 983.0	1.108	$2,g$	2	1	0	0	0	2	2	3	15	41
		$2,g$	1	2	0	0	0	4	2	3	15	46
9 983.2	1.108	$1,u$	0	2	1	5	1	0	0	3	16	95
9 983.2	1.131	$0,g^+$								1	15	<25
9 984.6	1.111	$1,g$	0	3	0	5	3	2	−2	3	16	43
		$1,g$	0	3	0	5	−1	2	2	3	16	48
9 987.5	1.133	$0,u^+$	1	0	0	3	3	7	−3	1	15	26
		$0,u^+$	0	1	0	3	3	9	−3	1	15	43
9 989.9	1.145	$1,u$	0	0	0	4	4	11	−3	0	15	30
		$1,u$	0	0	0	4	−4	11	5	0	15	30
9 991.4	1.142	$1,g$	0	0	0	7	3	8	−2	0	15	29
		$1,g$	0	0	0	7	−3	8	4	0	15	30
9 993.3	1.119	$1,u$	0	0	2	0	0	5	1	2	15	74
9 994.0	1.119	$1,g$	1	0	1	0	0	5	1	2	15	30
9 994.2	1.131	$2,g$	1	0	0	4	0	6	2	1	15	26
9 995.8	1.120	$0,g^-$	0	2	0	8	−2	2	2	2	16	93
9 997.5	1.134	$0,g^+$	0	1	0	2	2	10	−2	1	15	39
		$0,g^+$	0	1	0	2	0	10	0	1	15	33
9 997.9	1.132	$0,u^+$	0	0	1	2	2	8	−2	1	15	48
		$0,u^+$	0	0	1	2	0	8	0	1	15	35
9 999.5	1.121	$1,u$	0	1	1	1	1	6	0	2	15	42
		$1,u$	0	1	1	1	−1	6	2	2	15	52
9 999.5	1.117	$0,u^+$	0	1	1	8	0	0	0	2	16	88
9 999.6	1.120	$2,g$	0	2	0	8	4	2	−2	2	16	39
		$2,g$	0	2	0	8	0	2	2	2	16	43
10 000.9	1.133	$2,u$								1	15	<25
10 003.3	1.117	$2,u$	0	1	1	8	2	0	0	2	16	88

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 003.9	1.121	$0,u^+$	0	2	0	7	3	3	−3	2	16	29
		$0,u^+$	0	2	0	7	1	3	−1	2	16	60
10 004.2	1.121	$2,u$	0	2	0	7	5	3	−3	2	16	39
		$2,u$	0	2	0	7	3	3	−1	2	16	33
10 007.3	1.132	$0,g^+$	0	1	0	4	2	8	−2	1	15	27
10 010.3	1.144	$1,g$	0	0	0	5	−5	10	6	0	15	26
10 012.6	1.134	$2,g$	0	1	0	2	0	10	2	1	15	34
10 012.8	1.132	$2,u$	0	0	1	2	0	8	2	1	15	36
10 016.4	1.132	$2,g$								1	15	<25
10 020.3	1.132	$0,u^+$	1	0	0	3	3	7	−3	1	15	40
10 021.0	1.131	$0,g^-$	0	0	1	3	−1	7	1	1	15	80
10 021.1	1.122	$1,g$	0	2	0	1	−1	8	2	2	15	27
10 023.0	1.109	$1,g$	1	2	0	5	1	0	0	3	16	54
10 023.8	1.120	$1,g$	1	1	0	1	1	6	0	2	15	28
		$1,g$	1	1	0	1	−1	6	2	2	15	32
10 029.1	1.141	$1,u$	0	0	0	8	2	7	−1	0	15	27
		$1,u$	0	0	0	8	0	7	1	0	15	38
10 029.1	1.116	$0,g^+$	1	1	0	8	0	0	0	2	16	38
		$0,g^+$	0	1	1	7	1	1	−1	2	16	30
10 030.5	1.110	$1,g$	1	2	0	5	1	0	0	3	16	32
		$1,g$	0	3	0	5	1	2	0	3	16	39
10 031.9	1.117	$1,g$	2	0	0	1	−1	4	2	2	15	29
		$1,g$	1	0	1	0	0	5	1	2	15	45
10 032.0	1.146	$1,g$	0	0	0	3	1	12	0	0	15	36
		$1,g$	0	0	0	3	−1	12	2	0	15	34
10 032.2	1.132	$2,u$								1	15	<25
10 032.9	1.116	$2,g$	1	1	0	8	2	0	0	2	16	38
10 033.7	1.131	$2,g$	0	0	1	3	1	7	1	1	15	38
		$2,g$	0	0	1	3	−1	7	3	1	15	37
10 038.3	1.143	$1,u$	0	0	0	6	−2	9	3	0	15	26
10 041.2	1.132	$0,u^-$	0	0	1	2	−2	8	2	1	15	89
10 042.2	1.132	$0,g^+$	1	0	0	2	2	8	−2	1	15	39
		$0,g^+$	1	0	0	2	0	8	0	1	15	32
10 042.3	1.119	$1,g$	2	0	0	1	1	4	0	2	15	32
		$1,g$	2	0	0	1	−1	4	2	2	15	27
10 044.5	1.121	$0,u^-$	0	2	0	7	−3	3	3	2	16	75
10 047.0	1.121	$2,u$	0	2	0	7	5	3	−3	2	16	39
		$2,u$	0	2	0	7	1	3	1	2	16	29
10 050.0	1.128	$1,u$	0	1	0	12	2	1	−1	1	16	48
		$1,u$	0	1	0	12	0	1	1	1	16	37
10 052.8	1.112	$1,u$	0	3	0	4	4	3	−3	3	16	40
		$1,u$	0	3	0	4	2	3	−1	3	16	31
10 053.5	1.128	$1,g$	0	1	0	11	1	2	0	1	16	26
		$1,g$	0	1	0	13	1	0	0	1	16	27
10 055.2	1.132	$2,u$	0	0	1	2	2	8	0	1	15	39
		$2,u$	0	0	1	2	−2	8	4	1	15	47
10 055.4	1.145	$1,u$	0	0	0	4	4	11	−3	0	15	36
		$1,u$	0	0	0	4	−4	11	5	0	15	38
10 055.6	1.132	$0,u^-$	1	0	0	3	−1	7	1	1	15	41
		$0,u^-$	0	1	0	3	−1	9	1	1	15	40
10 055.6	1.120	$0,g^+$	0	2	0	8	2	2	−2	2	16	37
		$0,g^+$	0	2	0	8	0	2	0	2	16	52
10 056.8	1.132	$2,g$	1	0	0	2	0	8	2	1	15	32
10 058.1	1.127	$1,g$	0	1	0	13	1	0	0	1	16	57
10 058.4	1.134	$0,g^-$	1	0	0	2	−2	8	2	1	15	31
		$0,g^-$	0	1	0	2	−2	10	2	1	15	66
10 061.1	1.120	$2,g$	0	2	0	8	2	2	0	2	16	45
		$2,g$	0	2	0	8	0	2	2	2	16	33
10 065.4	1.120	$1,g$	1	1	0	1	1	6	0	2	15	28
		$1,g$	1	1	0	1	−1	6	2	2	15	29
10 065.9	1.117	$0,g^+$	1	1	0	8	0	0	0	2	16	39
		$0,g^+$	0	1	1	7	1	1	−1	2	16	45
10 067.6	1.132	$2,u$								1	15	<25
10 067.9	1.117	$2,g$	1	1	0	8	2	0	0	2	16	37

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		2,*g*	0	1	1	7	3	1	−1	2	16	35
10 068.1	1.102	0,g^+	0	4	0	2	2	2	−2	4	16	60
		0,g^+	0	4	0	2	0	2	0	4	16	37
10 071.7	1.130	1,*u*	0	1	0	10	2	3	−1	1	16	34
10 072.5	1.134	2,*g*	0	1	0	2	2	10	0	1	15	32
		2,*g*	0	1	0	2	−2	10	4	1	15	34
10 073.6	1.122	2,*g*	0	2	0	6	6	4	−4	2	16	44
		2,*g*	0	2	0	6	4	4	−2	2	16	28
10 074.2	1.117	0,u^+	1	1	0	7	1	1	−1	2	16	37
10 075.0	1.099	0,u^+	0	3	1	2	0	0	0	4	16	98
10 075.0	1.121	0,g^+	0	2	0	6	2	4	−2	2	16	42
		0,g^+	0	2	0	6	0	4	0	2	16	26
10 075.8	1.112	1,*u*	0	3	0	4	4	3	−3	3	16	40
		1,*u*	0	3	0	4	0	3	1	3	16	26
		1,*u*	0	3	0	4	−2	3	3	3	16	28
10 076.4	1.142	1,*g*	0	0	0	7	1	8	0	0	15	36
		1,*g*	0	0	0	7	−1	8	2	0	15	33
10 077.2	1.108	1,*g*	0	2	1	4	2	1	−1	3	16	54
		1,*g*	0	2	1	4	0	1	1	3	16	26
10 077.6	1.117	2,*u*	1	1	0	7	3	1	−1	2	16	26
10 079.0	1.099	2,*u*	0	3	1	2	2	0	0	4	16	99
10 082.3	1.102	0,g^-	0	4	0	2	−2	2	2	4	16	99
10 083.1	1.132	0,u^-	1	0	0	3	−1	7	1	1	15	40
		0,u^-	0	1	0	3	−1	9	1	1	15	40
10 083.4	1.115	0,g^+	0	0	2	6	0	0	0	2	16	73
10 084.8	1.144	1,*g*	0	0	0	5	3	10	−2	0	15	31
		1,*g*	0	0	0	5	−3	10	4	0	15	32
10 086.3	1.115	2,*g*	0	0	2	6	2	0	0	2	16	73
10 086.3	1.102	2,*g*	0	4	0	2	2	2	0	4	16	67
		2,*g*	0	4	0	2	0	2	2	4	16	29
10 093.3	1.121	0,u^+	0	2	0	7	3	3	−3	2	16	59
		0,u^+	0	2	0	7	1	3	−1	2	16	32
10 093.5	1.132	2,*u*								1	15	<25
10 095.4	1.132	0,g^-	1	0	0	2	−2	8	2	1	15	66
		0,g^-	0	1	0	2	−2	10	2	1	15	33
10 096.5	1.132	0,u^+	0	0	1	2	2	8	−2	1	15	44
		0,u^+	0	0	1	2	0	8	0	1	15	53
10 098.4	1.121	2,*u*	0	2	0	7	3	3	−1	2	16	36
		2,*u*	0	2	0	7	−1	3	3	2	16	41
10 099.1	1.130	1,*g*	0	1	0	9	3	4	−2	1	16	28
		1,*g*	0	1	0	9	1	4	0	1	16	26
10 099.1	1.117	0,g^-	0	1	1	7	−1	1	1	2	16	90
10 099.7	1.146	1,*g*	0	0	0	3	3	12	−2	0	15	39
		1,*g*	0	0	0	3	−3	12	4	0	15	40
10 100.9	1.122	1,*g*	0	1	1	0	0	7	1	2	15	95
10 104.5	1.118	2,*g*	0	1	1	7	1	1	1	2	16	65
10 104.5	1.102	0,g^+	0	4	0	2	2	2	−2	4	16	38
		0,g^+	0	4	0	2	0	2	0	4	16	55
10 105.3	1.121	2,*g*	0	2	0	6	6	4	−4	2	16	35
10 105.4	1.111	1,*u*	0	3	0	4	2	3	−1	3	16	25
		1,*u*	0	3	0	4	−2	3	3	3	16	42
10 105.5	1.122	0,g^-	0	2	0	6	−4	4	4	2	16	61
		0,g^-	0	2	0	6	−2	4	2	2	16	30
10 107.4	1.116	0,u^+	1	0	1	6	0	0	0	2	16	61
10 108.2	1.109	1,*g*	0	2	1	4	2	1	−1	3	16	34
		1,*g*	0	2	1	4	0	1	1	3	16	62
10 108.6	1.132	2,*g*	1	0	0	2	2	8	0	1	15	29
		2,*g*	1	0	0	2	−2	8	4	1	15	37
10 109.7	1.116	2,*u*	1	0	1	6	2	0	0	2	16	61
10 109.8	1.132	2,*u*	0	0	1	2	0	8	2	1	15	50
10 113.6	1.102	2,*g*	0	4	0	2	2	2	0	4	16	25
		2,*g*	0	4	0	2	0	2	2	4	16	68
10 116.3	1.108	1,*u*	1	2	0	4	2	1	−1	3	16	34
10 116.5	1.133	0,g^+	0	0	1	1	1	9	−1	1	15	90

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 118.3	1.123	1,u	1	1	0	0	0	7	1	2	15	36
		1,u	0	2	0	0	0	9	1	2	15	56
10 122.5	1.106	1,g	0	1	2	3	1	0	0	3	16	74
10 123.2	1.129	1,g	0	1	0	11	3	2	−2	1	16	42
		1,g	0	1	0	11	−1	2	2	1	16	44
10 123.5	1.143	1,u	0	0	0	6	2	9	−1	0	15	26
		1,u	0	0	0	6	0	9	1	0	15	39
10 123.5	1.098	0,g^+	1	3	0	2	0	0	0	4	16	90
10 124.4	1.118	2,u	0	1	1	6	4	2	−2	2	16	33
10 125.5	1.118	0,u^+	1	1	0	7	1	1	−1	2	16	37
10 126.8	1.092	1,u	0	5	0	0	0	1	1	5	16	100
10 127.2	1.129	1,u								1	16	<25
10 127.3	1.098	2,g	1	3	0	2	2	0	0	4	16	90
10 127.8	1.133	0,g^+	1	0	0	2	0	8	0	1	15	26
		0,g^+	0	1	0	2	0	10	0	1	15	30
10 128.6	1.135	0,u^+	1	0	0	1	1	9	−1	1	15	29
		0,u^+	0	1	0	1	1	11	−1	1	15	68
10 130.4	1.117	0,u^-	1	1	0	7	−1	1	1	2	16	43
		0,u^-	0	1	1	6	−2	2	2	2	16	28
10 130.8	1.129	1,u								1	16	<25
10 130.9	1.145	1,u	0	0	0	4	2	11	−1	0	15	29
		1,u	0	0	0	4	−2	11	3	0	15	31
10 130.9	1.133	2,g	0	0	1	1	1	9	1	1	15	44
		2,g	0	0	1	1	−1	9	3	1	15	45
10 133.1	1.118	0,g^+	1	0	1	5	1	1	−1	2	16	31
10 136.4	1.117	2,u								2	16	<25
10 136.7	1.117	2,g								2	16	<25
10 138.3	1.131	1,u								1	16	<25
10 140.6	1.133	2,g	1	0	0	2	0	8	2	1	15	27
		2,g	0	1	0	2	0	10	2	1	15	30
10 142.8	1.126	1,u	0	0	1	11	1	0	0	1	16	94
10 143.0	1.135	2,u	0	1	0	1	1	11	1	1	15	35
		2,u	0	1	0	1	−1	11	3	1	15	34
10 143.2	1.121	0,g^+	0	2	0	6	4	4	−4	2	16	55
10 143.4	1.147	1,u	0	0	0	2	2	13	−1	0	15	27
		1,u	0	0	0	2	0	13	1	0	15	47
		1,u	0	0	0	2	−2	13	3	0	15	26
10 143.8	1.110	1,u	0	3	0	4	0	3	1	3	16	29
10 145.2	1.127	1,g	0	0	1	10	2	1	−1	1	16	45
		1,g	0	0	1	10	0	1	1	1	16	35
10 145.8	1.120	1,u	2	0	0	0	0	5	1	2	15	56
		1,u	0	2	0	0	0	9	1	2	15	28
10 146.9	1.106	1,u	1	1	1	3	1	0	0	3	16	64
10 146.9	1.130	1,g	0	1	0	9	5	4	−4	1	16	32
10 147.1	1.121	2,g	0	2	0	6	4	4	−2	2	16	31
		2,g	0	2	0	6	−2	4	4	2	16	28
10 151.7	1.120	0,u^-	0	2	0	7	−1	3	1	2	16	72
10 152.8	1.116	0,u^+	0	0	2	5	1	1	−1	2	16	58
10 153.3	1.116	2,u	0	0	2	5	3	1	−1	2	16	47
10 157.4	1.110	1,u	1	2	0	4	0	1	1	3	16	36
10 158.2	1.120	2,u	0	2	0	7	1	3	1	2	16	45
10 158.4	1.127	1,u	0	0	1	9	1	2	0	1	16	31
10 159.1	1.122	0,u^+	0	2	0	5	3	5	−3	2	16	29
		0,u^+	0	2	0	5	1	5	−1	2	16	39
10 159.1	1.133	0,g^+	1	0	0	2	0	8	0	1	15	30
10 164.0	1.118	0,u^-	1	1	0	7	−1	1	1	2	16	40
		0,u^-	0	1	1	6	−2	2	2	2	16	40
10 167.8	1.118	2,u	1	1	0	7	1	1	1	2	16	29
10 170.3	1.144	1,g	0	0	0	5	1	10	0	0	15	36
		1,g	0	0	0	5	−1	10	2	0	15	35
10 170.5	1.133	2,g	1	0	0	2	0	8	2	1	15	28
10 170.5	1.133	0,u^+	1	0	0	1	1	9	−1	1	15	68
		0,u^+	0	1	0	1	1	11	−1	1	15	31
10 170.9	1.117	0,g^+	1	0	1	5	1	1	−1	2	16	45

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 171.2	1.121	1,*u*	2	0	0	0	0	5	1	2	15	27
		1,*u*	1	1	0	0	0	7	1	2	15	54
10 171.3	1.122	2,*u*	0	2	0	5	5	5	−3	2	16	26
		2,*u*	0	2	0	5	3	5	−1	2	16	29
10 171.8	1.133	0,g^-	0	0	1	1	−1	9	1	1	15	96
10 171.9	1.117	2,*g*	1	0	1	5	3	1	−1	2	16	26
		2,*g*	1	1	0	6	4	2	−2	2	16	25
10 175.7	1.112	1,*g*	0	3	0	3	1	4	0	3	16	31
10 176.1	1.131	1,*u*	0	1	0	8	6	5	−5	1	16	32
10 176.2	1.118	0,g^-	1	1	0	6	−2	2	2	2	16	40
10 176.5	1.146	1,*g*	0	0	0	3	3	12	−2	0	15	35
		1,*g*	0	0	0	3	−3	12	4	0	15	36
10 177.0	1.105	1,*u*	0	0	3	1	1	0	0	3	16	41
10 179.9	1.122	0,u^-	0	2	0	5	−5	5	5	2	16	55
		0,u^-	0	2	0	5	−3	5	3	2	16	30
10 181.0	1.128	1,*g*								1	16	<25
10 181.4	1.118	2,*g*								2	16	<25
10 182.5	1.108	1,*u*	0	2	1	3	3	2	−2	3	16	40
10 182.5	1.116	0,u^-	0	0	2	5	−1	1	1	2	16	71
10 184.5	1.133	2,*u*	1	0	0	1	1	9	1	1	15	35
		2,*u*	1	0	0	1	−1	9	3	1	15	33
10 185.5	1.133	2,*g*	0	0	1	1	1	9	1	1	15	45
		2,*g*	0	0	1	1	−1	9	3	1	15	47
10 186.0	1.104	1,*g*	1	0	2	1	1	0	0	3	16	84
10 187.6	1.116	2,*u*	0	0	2	5	1	1	1	2	16	55
10 190.6	1.121	0,g^-	0	2	0	6	−2	4	2	2	16	60
10 190.8	1.132	1,*g*								1	16	<25
10 191.1	1.119	2,*g*	0	1	1	5	5	3	−3	2	16	34
10 195.2	1.130	1,*u*	0	1	0	10	−2	3	3	1	16	35
10 196.1	1.118	0,g^+	0	1	1	5	1	3	−1	2	16	30
10 197.0	1.121	2,*g*	0	2	0	6	−2	4	4	2	16	28
10 197.9	1.127	1,*g*	1	0	0	11	1	0	0	1	16	41
10 198.2	1.118	0,u^+	0	1	1	6	2	2	−2	2	16	41
		0,u^+	0	1	1	6	0	2	0	2	16	51
10 198.4	1.113	1,*g*	0	3	0	3	3	4	−2	3	16	29
		1,*g*	0	3	0	3	−3	4	4	3	16	47
10 199.9	1.134	0,u^-	1	0	0	1	−1	9	1	1	15	41
		0,u^-	0	1	0	1	−1	11	1	1	15	59
10 201.0	1.128	1,*g*	1	0	0	11	1	0	0	1	16	28
10 201.4	1.122	0,u^+	0	2	0	5	5	5	−5	2	16	61
10 202.5	1.109	1,*u*	0	2	1	3	3	2	−2	3	16	26
		1,*u*	0	2	1	3	−1	2	2	3	16	42
10 203.3	1.129	1,*g*								1	16	<25
10 205.2	1.118	2,*u*	0	1	1	6	2	2	0	2	16	40
		2,*u*	0	1	1	6	0	2	2	2	16	46
10 205.8	1.122	2,*u*	0	2	0	5	5	5	−3	2	16	26
		2,*u*	0	2	0	5	−1	5	3	2	16	26
10 208.0	1.117	0,g^-	1	0	1	5	−1	1	1	2	16	60
10 208.8	1.126	1,*u*	1	0	0	10	2	1	−1	1	16	32
		1,*u*	1	0	0	10	0	1	1	1	16	30
10 210.6	1.119	0,u^+								2	16	<25
10 210.7	1.117	2,*g*	1	0	1	5	1	1	1	2	16	37
10 211.2	1.100	0,g^+	0	3	1	1	1	1	−1	4	16	94
10 212.7	1.118	2,*u*	1	0	1	4	4	2	−2	2	16	25
10 213.3	1.134	2,*u*	0	1	0	1	1	11	1	1	15	29
		2,*u*	0	1	0	1	−1	11	3	1	15	30
10 214.9	1.127	1,*g*	0	0	1	10	2	1	−1	1	16	37
		1,*g*	0	0	1	10	0	1	1	1	16	57
10 215.4	1.129	1,*u*								1	16	<25
10 217.0	1.145	1,*u*	0	0	0	4	2	11	−1	0	15	25
		1,*u*	0	0	0	4	0	11	1	0	15	43
10 217.5	1.132	1,*g*	0	1	0	7	7	6	−6	1	16	37
10 219.1	1.128	1,*u*	0	0	1	9	3	2	−2	1	16	30
		1,*u*	0	0	1	9	−1	2	2	1	16	44

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 221.0	1.109	1,g	1	2	0	3	3	2	−2	3	16	27
10 221.3	1.131	1,u								1	16	<25
10 221.8	1.147	1,u	0	0	0	2	2	13	−1	0	15	49
		1,u	0	0	0	2	−2	13	3	0	15	51
10 222.7	1.118	0,g^-	1	1	0	6	−2	2	2	2	16	35
		0,g^-	0	1	1	5	−3	3	3	2	16	37
10 222.9	1.103	0,u^+	0	4	0	1	1	3	−1	4	16	92
10 224.1	1.100	0,g^-	0	3	1	1	−1	1	1	4	16	99
10 224.8	1.118	2,g								2	16	<25
10 225.3	1.112	1,g	0	3	0	3	−3	4	4	3	16	33
10 226.8	1.116	0,g^+	2	0	0	6	0	0	0	2	16	33
10 227.0	1.117	2,g	0	0	2	4	4	2	−2	2	16	40
10 230.2	1.128	1,g	0	0	1	8	4	3	−3	1	16	35
10 231.2	1.118	0,g^+								2	16	<25
10 231.9	1.100	2,g	0	3	1	1	1	1	1	4	16	98
10 232.5	1.109	1,u	0	2	1	3	1	2	0	3	16	58
		1,u	0	2	1	3	−1	2	2	3	16	29
10 232.7	1.121	0,u^-	0	2	0	5	−5	5	5	2	16	31
10 234.7	1.116	2,g	2	0	0	6	2	0	0	2	16	41
10 235.0	1.107	1,u	0	1	2	2	2	1	−1	3	16	55
10 235.0	1.134	0,u^-	1	0	0	1	−1	9	1	1	15	59
		0,u^-	0	1	0	1	−1	11	1	1	15	41
10 235.5	1.128	1,g	1	0	0	9	3	2	−2	1	16	28
10 235.9	1.115	0,g^+	2	0	0	6	0	0	0	2	16	40
10 239.6	1.103	2,u	0	4	0	1	1	3	1	4	16	52
		2,u	0	4	0	1	−1	3	3	4	16	43
10 240.0	1.117	2,g								2	16	<25
10 240.4	1.120	2,u								2	16	<25
10 242.9	1.141	2,u	0	0	0	11	5	5	−3	0	16	32
		2,u	0	0	0	11	3	5	−1	0	16	26
10 245.0	1.119	0,u^-	1	0	1	4	−2	2	2	2	16	30
10 245.3	1.141	0,u^+	0	0	0	11	3	5	−3	0	16	35
		0,u^+	0	0	0	11	1	5	−1	0	16	54
10 245.7	1.109	1,g	1	2	0	3	3	2	−2	3	16	31
10 247.0	1.134	0,u^+	0	0	1	0	0	10	0	1	15	96
10 247.2	1.119	2,u								2	16	<25
10 247.6	1.134	2,u	1	0	0	1	1	9	1	1	15	26
		2,u	1	0	0	1	−1	9	3	1	15	31
10 247.6	1.118	0,u^+	1	1	0	5	1	3	−1	2	16	28
10 247.6	1.121	0,g^+	0	2	0	6	2	4	−2	2	16	32
		0,g^+	0	2	0	6	0	4	0	2	16	38
10 247.8	1.103	0,u^-	0	4	0	1	−1	3	1	4	16	88
10 248.5	1.141	2,g	0	0	0	10	6	6	−4	0	16	30
10 249.2	1.140	2,g	0	0	0	12	4	4	−2	0	16	36
		2,g	0	0	0	12	2	4	0	0	16	27
10 249.7	1.119	2,u	1	0	1	4	4	2	−2	2	16	32
10 249.9	1.140	0,g^+	0	0	0	12	2	4	−2	0	16	49
		0,g^+	0	0	0	12	0	4	0	0	16	33
10 250.1	1.132	1,g								1	16	<25
10 250.1	1.107	1,u	0	1	2	2	0	1	1	3	16	59
10 252.6	1.117	0,g^-	0	0	2	4	−2	2	2	2	16	60
10 252.9	1.141	0,g^+	0	0	0	10	4	6	−4	0	16	25
		0,g^+	0	0	0	10	2	6	−2	0	16	42
10 255.4	1.121	2,g	0	2	0	6	2	4	0	2	16	26
		2,g	0	2	0	6	0	4	2	2	16	29
10 255.8	1.107	1,g	1	1	1	2	2	1	−1	3	16	41
10 257.2	1.118	2,g	0	0	2	4	2	2	0	2	16	26
10 258.0	1.129	1,u	0	0	1	7	5	4	−4	1	16	27
10 260.2	1.123	0,g^+	0	2	0	4	2	6	−2	2	16	37
10 260.3	1.099	0,u^+	1	3	0	1	1	1	−1	4	16	87
10 261.0	1.134	2,u	0	0	1	0	0	10	2	1	15	94
10 261.2	1.103	2,u	0	4	0	1	1	3	1	4	16	37
		2,u	0	4	0	1	−1	3	3	4	16	55
10 261.8	1.133	1,u								1	16	<25

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 261.8	1.119	$0,g^+$								2	16	<25
10 263.3	1.111	1,*g*	0	3	0	3	1	4	0	3	16	26
		1,*g*	0	3	0	3	−1	4	2	3	16	28
10 263.5	1.146	1,*g*	0	0	0	3	1	12	0	0	15	40
		1,*g*	0	0	0	3	−1	12	2	0	15	40
10 263.7	1.130	1,*g*								1	16	<25
10 266.0	1.130	1,*g*	0	1	0	9	3	4	−2	1	16	29
10 266.5	1.139	$0,u^+$	0	0	0	13	3	3	−3	0	16	30
		$0,u^+$	0	0	0	13	1	3	−1	0	16	70
10 266.6	1.142	2,*u*	0	0	0	9	9	7	−7	0	16	33
		2,*u*	0	0	0	9	7	7	−5	0	16	28
10 266.7	1.127	1,*u*	1	0	0	10	0	1	1	1	16	30
10 266.7	1.148	1,*g*	0	0	0	1	1	14	0	0	15	50
		1,*g*	0	0	0	1	−1	14	2	0	15	50
10 267.2	1.139	2,*u*	0	0	0	13	5	3	−3	0	16	28
		2,*u*	0	0	0	13	3	3	−1	0	16	41
10 267.5	1.119	2,*g*								2	16	<25
10 268.2	1.128	1,*u*								1	16	<25
10 271.7	1.135	$0,g^+$	1	0	0	0	0	10	0	1	15	37
		$0,g^+$	0	1	0	0	0	12	0	1	15	63
10 273.1	1.130	1,*u*								1	16	<25
10 273.1	1.142	$0,u^+$	0	0	0	9	3	7	−3	0	16	32
		$0,u^+$	0	0	0	9	1	7	−1	0	16	41
10 273.8	1.106	1,*g*	1	1	1	2	2	1	−1	3	16	35
10 274.4	1.120	$0,u^+$								2	16	<25
10 274.6	1.118	$0,u^-$	1	0	1	4	−2	2	2	2	16	45
		$0,u^-$	1	1	0	5	−3	3	3	2	16	34
10 275.0	1.130	1,*u*								1	16	<25
10 275.5	1.099	$0,u^-$	1	3	0	1	−1	1	1	4	16	88
10 275.5	1.097	$0,g^+$	0	2	2	0	0	0	0	4	16	85
10 276.0	1.118	2,*u*								2	16	<25
10 276.4	1.123	2,*g*	0	2	0	4	2	6	0	2	16	26
10 278.9	1.119	$0,u^+$								2	16	<25
10 279.1	1.107	1,*g*	2	1	0	3	1	0	0	3	16	31
		1,*g*	1	1	1	2	0	1	1	3	16	30
10 279.8	1.127	1,*g*	1	0	0	9	−1	2	2	1	16	36
10 281.6	1.117	$0,g^+$	0	0	2	4	2	2	−2	2	16	29
		$0,g^+$	0	0	2	4	0	2	0	2	16	42
10 282.1	1.099	2,*u*	1	3	0	1	1	1	1	4	16	88
10 282.3	1.119	2,*u*								2	16	<25
10 285.6	1.135	2,*g*	1	0	0	0	0	10	2	1	15	36
		2,*g*	0	1	0	0	0	12	2	1	15	64
10 286.0	1.109	1,*g*								3	16	<25
10 286.7	1.127	1,*u*	0	0	1	9	1	2	0	1	16	49
		1,*u*	0	0	1	9	−1	2	2	1	16	32
10 288.9	1.117	2,*g*	0	0	2	4	2	2	0	2	16	27
		2,*g*	0	0	2	4	0	2	2	2	16	40
10 289.0	1.121	$0,u^+$	0	2	0	5	3	5	−3	2	16	34
10 289.8	1.131	1,*g*	0	1	0	7	−5	6	6	1	16	29
10 290.0	1.123	$0,g^-$	0	2	0	4	−4	6	4	2	16	52
		$0,g^-$	0	2	0	4	−2	6	2	2	16	26
10 292.1	1.133	1,*u*								1	16	<25
10 292.2	1.118	2,*u*								2	16	<25
10 292.6	1.128	1,*g*	0	0	1	8	−2	3	3	1	16	39
10 293.4	1.119	$0,u^-$	0	1	1	4	−4	4	4	2	16	43
10 294.1	1.141	2,*g*	0	0	0	10	8	6	−6	0	16	36
10 295.2	1.138	$0,g^+$	0	0	0	14	2	2	−2	0	16	53
		$0,g^+$	0	0	0	14	0	2	0	0	16	47
10 295.4	1.121	2,*u*	0	2	0	5	3	5	−1	2	16	27
10 295.8	1.141	$0,g^-$	0	0	0	10	−6	6	6	0	16	36
		$0,g^-$	0	0	0	10	−4	6	4	0	16	45
10 296.6	1.119	$0,g^-$	0	1	1	5	−1	3	1	2	16	79
10 296.9	1.138	2,*g*	0	0	0	14	4	2	−2	0	16	39
		2,*g*	0	0	0	14	2	2	0	0	16	45

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 298.2	1.141	$0,u^-$	0	0	0	11	−5	5	5	0	16	45
		$0,u^-$	0	0	0	11	−3	5	3	0	16	47
10 298.6	1.141	$2,u$	0	0	0	11	7	5	−5	0	16	36
10 299.2	1.130	$1,g$								1	16	<25
10 299.2	1.119	$0,g^+$	1	0	1	3	1	3	−1	2	16	30
10 299.9	1.116	$0,u^+$	2	0	0	5	1	1	−1	2	16	60
10 300.8	1.142	$2,u$	0	0	0	9	9	7	−7	0	16	38
10 301.8	1.128	$1,u$	1	0	0	8	−2	3	3	1	16	27
		$1,u$	0	0	1	7	5	4	−4	1	16	28
10 302.9	1.097	$0,u^+$	1	2	1	0	0	0	0	4	16	94
10 305.1	1.117	$2,u$	2	0	0	5	3	1	−1	2	16	36
10 305.3	1.119	$2,g$	0	1	1	5	1	3	1	2	16	47
		$2,g$	0	1	1	5	−1	3	3	2	16	30
10 306.5	1.142	$0,u^-$	0	0	0	9	−7	7	7	0	16	33
		$0,u^-$	0	0	0	9	−5	7	5	0	16	41
10 306.6	1.107	$1,g$	0	0	3	0	0	1	1	3	16	32
10 306.6	1.143	$0,g^+$	0	0	0	8	4	8	−4	0	16	25
		$0,g^+$	0	0	0	8	2	8	−2	0	16	34
10 308.4	1.122	$2,g$	0	2	0	4	−4	6	6	2	16	27
10 308.5	1.117	$0,u^+$	1	0	1	4	0	2	0	2	16	37
10 309.8	1.113	$1,u$	0	3	0	2	0	5	1	3	16	34
10 309.8	1.147	$1,u$	0	0	0	2	0	13	1	0	15	53
10 310.1	1.129	$1,u$	0	0	1	7	−3	4	4	1	16	34
10 311.1	1.134	$0,g^+$	1	0	0	0	0	10	0	1	15	63
		$0,g^+$	0	1	0	0	0	12	0	1	15	37
10 311.3	1.108	$1,g$								3	16	<25
10 312.9	1.118	$2,u$								2	16	<25
10 313.1	1.140	$0,g^-$	0	0	0	12	−4	4	4	0	16	59
		$0,g^-$	0	0	0	12	−2	4	2	0	16	41
10 313.9	1.143	$2,g$	0	0	0	8	6	8	−4	0	16	26
10 314.1	1.130	$1,g$								1	16	<25
10 314.8	1.140	$2,g$	0	0	0	12	6	4	−4	0	16	39
		$2,g$	0	0	0	12	0	4	2	0	16	30
10 315.1	1.119	$2,g$								2	16	<25
10 316.3	1.105	$1,u$	1	0	2	0	0	1	1	3	16	80
10 318.0	1.119	$0,u^+$	0	0	2	3	3	3	−3	2	16	27
10 321.5	1.133	$1,u$	0	1	0	6	−6	7	7	1	16	37
10 322.0	1.119	$0,g^-$	1	0	1	3	−3	3	3	2	16	42
10 322.9	1.118	$0,u^+$	0	0	2	3	1	3	−1	2	16	33
		$0,u^+$	0	1	1	4	4	4	−4	2	16	26
10 324.5	1.134	$2,g$	1	0	0	0	0	10	2	1	15	63
		$2,g$	0	1	0	0	0	12	2	1	15	36
10 324.6	1.130	$1,u$								1	16	<25
10 325.2	1.122	$0,g^+$	0	2	0	4	4	6	−4	2	16	50
10 325.8	1.118	$0,u^-$	2	0	0	5	−1	1	1	2	16	31
10 326.0	1.119	$2,u$								2	16	<25
10 327.0	1.110	$1,g$	0	2	1	2	2	3	−1	3	16	38
		$1,g$	0	2	1	2	−2	3	3	3	16	46
10 331.4	1.119	$0,u^-$								2	16	<25
10 331.9	1.143	$0,g^-$	0	0	0	8	−8	8	8	0	16	35
		$0,g^-$	0	0	0	8	−6	8	6	0	16	35
10 332.9	1.118	$2,u$								2	16	<25
10 333.3	1.130	$1,g$								1	16	<25
10 334.0	1.117	$0,u^-$	2	0	0	5	−1	1	1	2	16	35
		$0,u^-$	0	0	2	3	−3	3	3	2	16	27
10 335.4	1.128	$1,g$	1	0	0	9	1	2	0	1	16	26
10 335.7	1.131	$1,u$	0	1	0	8	−2	5	3	1	16	26
10 335.8	1.137	$0,u^+$	0	0	0	15	1	1	−1	0	16	100
10 336.1	1.118	$2,u$	0	0	2	3	3	3	−1	2	16	27
10 837.4	1.119	$0,g^+$								2	16	<25
10 338.3	1.137	$2,u$	0	0	0	15	3	1	−1	0	16	60
		$2,u$	0	0	0	15	1	1	1	0	16	40
10 338.8	1.122	$2,g$	0	2	0	4	−4	6	6	2	16	39
10 340.1	1.130	$1,g$								1	16	<25

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 340.4	1.139	$0,u^-$	0	0	0	13	−3	3	3	0	16	79
10 341.7	1.113	$1,u$	0	3	0	2	2	5	−1	3	16	31
		$1,u$	0	3	0	2	−2	5	3	3	16	45
10 842.0	1.118	$2,u$	2	0	0	5	1	1	1	2	16	25
10 343.0	1.139	$2,u$	0	0	0	13	5	3	−3	0	16	43
		$2,u$	0	0	0	13	1	3	1	0	16	26
		$2,u$	0	0	0	13	−1	3	3	0	16	30
10 343.9	1.142	$0,u^+$	0	0	0	9	7	7	−7	0	16	59
10 344.2	1.121	$0,u^-$	0	2	0	5	−1	5	1	2	16	48
10 344.7	1.142	$2,u$								0	16	<25
10 345.0	1.134	$1,g$								1	16	<25
10 345.0	1.141	$0,g^+$	0	0	0	10	6	6	−6	0	16	63
10 345.4	1.130	$1,g$								1	16	<25
10 346.7	1.131	$1,g$								1	16	<25
10 347.3	1.141	$2,g$	0	0	0	10	8	6	−6	0	16	25
10 348.4	1.109	$1,u$								3	16	<25
10 349.0	1.119	$0,g^+$	1	0	1	3	3	3	−3	2	16	40
10 350.7	1.130	$1,u$	1	0	0	6	6	5	−5	1	16	27
10 350.8	1.119	$2,g$								2	16	<25
10 350.9	1.129	$1,u$								1	16	<25
10 351.5	1.118	$0,u^+$	0	0	2	3	3	3	−3	2	16	34
		$0,u^+$	0	0	2	3	1	3	−1	2	16	28
10 351.7	1.120	$2,g$								2	16	<25
10 353.2	1.143	$2,g$	0	0	0	8	8	8	−6	0	16	30
10 353.6	1.121	$2,u$	0	2	0	5	1	5	1	2	16	29
10 354.6	1.119	$0,g^-$	1	0	1	3	−3	3	3	2	16	29
		$0,g^-$	1	1	0	4	−4	4	4	2	16	46
10 355.9	1.148	$1,g$	0	0	0	1	1	14	0	0	15	50
		$1,g$	0	0	0	1	−1	14	2	0	15	50
10 356.0	1.143	$0,g^+$	0	0	0	8	8	8	−8	0	16	63
10 356.3	1.110	$1,g$	0	2	1	2	0	3	1	3	16	61
10 356.5	1.144	$0,u^+$	0	0	0	7	3	9	−3	0	16	32
		$0,u^+$	0	0	0	7	1	9	−1	0	16	41
10 358.3	1.128	$1,g$	0	0	1	8	2	3	−1	1	16	28
		$1,g$	0	0	1	8	0	3	1	1	16	45
10 358.8	1.141	$0,u^+$	0	0	0	11	5	5	−5	0	16	69
		$0,u^+$	0	0	0	11	1	5	−1	0	16	28
10 359.0	1.133	$1,u$	0	1	0	6	−6	7	7	1	16	26
10 359.3	1.120	$0,u^-$	1	1	0	5	−1	3	1	2	16	38
10 359.6	1.105	$1,u$	2	0	1	1	1	0	0	3	16	47
		$1,u$	0	0	3	1	1	0	0	3	16	31
10 360.4	1.118	$2,u$	0	0	2	3	−1	3	3	2	16	28
10 361.9	1.141	$2,u$	0	0	0	11	7	5	−5	0	16	27
		$2,u$	0	0	0	11	−3	5	5	0	16	27
10 364.1	1.108	$1,g$	0	1	2	1	1	2	0	3	16	44
		$1,g$	0	1	2	1	−1	2	2	3	16	29
10 365.4	1.129	$1,u$	0	0	1	7	3	4	−2	1	16	26
		$1,u$	0	0	1	7	−3	4	4	1	16	27
10 367.3	1.120	$2,u$								2	16	<25
10 369.0	1.121	$0,g^-$	1	1	0	4	−2	4	2	2	16	25
		$0,g^-$	0	2	0	4	−2	6	2	2	16	30
10 369.8	1.144	$2,u$	0	0	0	7	3	9	−1	0	16	25
10 372.0	1.101	$0,u^+$	0	3	1	0	0	2	0	4	16	98
10 372.6	1.109	$1,u$	1	2	0	2	−2	3	3	3	16	31
10 372.8	1.129	$1,g$	1	0	0	7	−3	4	4	1	16	30
10 373.5	1.118	$0,g^+$								2	16	<25
10 374.5	1.123	$0,u^+$	0	2	0	3	1	7	−1	2	16	47
10 375.3	1.117	$2,g$	2	0	0	4	4	2	−2	2	16	49
10 377.0	1.108	$1,g$	0	1	2	1	1	2	0	3	16	33
		$1,g$	0	1	2	1	−1	2	2	3	16	44
10 378.4	1.118	$0,g^+$								2	16	<25
10 379.8	1.138	$0,g^-$	0	0	0	14	−2	2	2	0	16	100
10 380.3	1.131	$1,u$								1	16	<25
10 380.4	1.118	$0,u^-$	0	0	2	3	−1	3	1	2	16	63

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 380.5	1.120	2,g								2	16	<25
10 381.0	1.111	1,u	0	3	0	2	0	5	1	3	16	29
10 381.7	1.118	2,g								2	16	<25
10 382.3	1.109	1,u								3	16	<25
10 382.3	1.134	1,g								1	16	<25
10 383.1	1.138	2,g	0	0	0	14	4	2	−2	0	16	46
		2,g	0	0	0	14	0	2	2	0	16	49
10 384.0	1.130	1,g	0	0	1	6	−4	5	5	1	16	28
10 385.0	1.140	0,g^+	0	0	0	12	4	4	−4	0	16	74
10 385.4	1.101	2,u	0	3	1	0	0	2	2	4	16	98
10 387.1	1.120	0,g^-	0	2	0	4	−2	6	2	2	16	28
10 388.2	1.136	0,g^+	0	0	0	16	0	0	0	0	16	100
10 388.4	1.143	0,g^-	0	0	0	8	−8	8	8	0	16	55
		0,g^-	0	0	0	8	−4	8	4	0	16	27
10 388.7	1.140	2,g	0	0	0	12	6	4	−4	0	16	27
		2,g	0	0	0	12	−2	4	4	0	16	37
10 388.9	1.110	0,g^+	0	3	0	8	0	0	0	3	17	95
10 389.2	1.131	1,u								1	16	<25
10 389.8	1.118	2,u	0	0	2	3	1	3	1	2	16	35
		2,u	0	0	2	3	−1	3	3	2	16	27
10 389.9	1.144	0,u^-	0	0	0	7	−7	9	7	0	16	33
		0,u^-	0	0	0	7	−5	9	5	0	16	41
10 389.9	1.103	0,g^+	0	4	0	0	0	4	0	4	16	84
10 390.0	1.142	0,u^-	0	0	0	9	−7	7	7	0	16	56
		0,u^-	0	0	0	9	−3	7	3	0	16	33
10 391.0	1.123	2,u	0	2	0	3	1	7	1	2	16	26
10 391.4	1.136	2,g	0	0	0	16	2	0	0	0	16	100
10 391.7	1.101	1,g	0	4	0	5	1	0	0	4	17	98
10 391.7	1.119	0,g^+	0	1	1	3	1	5	−1	2	16	29
10 392.8	1.110	2,g	0	3	0	8	2	0	0	3	17	95
10 394.2	1.107	1,u	2	1	0	2	2	1	−1	3	16	45
10 394.4	1.120	0,u^+	0	1	1	4	2	4	−2	2	16	45
		0,u^+	0	1	1	4	0	4	0	2	16	47
10 394.6	1.120	2,g								2	16	<25
10 395.3	1.142	2,u	0	0	0	9	−5	7	7	0	16	27
10 395.4	1.143	2,g								0	16	<25
10 398.7	1.118	0,g^-	2	0	0	4	−2	2	2	2	16	47
10 400.8	1.107	1,u	2	1	0	2	0	1	1	3	16	37
		1,u	1	1	1	1	1	2	0	3	16	41
10 401.2	1.120	2,g								2	16	<25
10 401.9	1.149	1,u	0	0	0	0	0	15	1	0	15	100
10 403.3	1.131	1,g								1	16	<25
10 403.4	1.129	1,u	1	0	0	8	0	3	1	1	16	26
10 403.5	1.141	0,g^-	0	0	0	10	−6	6	6	0	16	56
		0,g^-	0	0	0	10	−2	6	2	0	16	35
10 404.3	1.132	1,g								1	16	<25
10 404.8	1.120	2,u	0	1	1	4	2	4	0	2	16	25
		2,u	0	1	1	4	0	4	2	2	16	47
10 404.9	1.104	2,g	0	4	0	0	0	4	2	4	16	88
10 405.4	1.109	1,u	1	1	1	1	−1	2	2	3	16	36
10 406.7	1.131	1,u								1	16	<25
10 408.4	1.141	2,g	0	0	0	10	−4	6	6	0	16	33
10 408.8	1.120	0,u^+								2	16	<25
10 409.1	1.118	0,g^-	1	0	1	3	−1	3	1	2	16	55
10 410.1	1.144	2,u								0	16	<25
10 410.7	1.131	1,u								1	16	<25
10 412.2	1.118	2,g								2	16	<25
10 413.9	1.123	0,u^-	0	2	0	3	−3	7	3	2	16	54
10 415.2	1.109	1,u	1	2	0	2	0	3	1	3	16	27
10 415.8	1.120	0,g^-	1	1	0	4	−2	4	2	2	16	27
		0,g^-	0	1	1	3	−3	5	3	2	16	36
10 415.9	1.119	2,g								2	16	<25
10 417.3	1.130	1,u	0	1	0	8	0	5	1	1	16	25
10 419.7	1.145	0,g^+	0	0	0	6	4	10	−4	0	16	25

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,g^+$	0	0	0	6	2	10	−2	0	16	42
10 419.8	1.132	$1,u$	0	0	1	5	−5	6	6	1	16	30
10 421.7	1.119	$0,g^+$								2	16	<25
10 421.8	1.099	$0,g^+$	1	3	0	0	0	2	0	4	16	61
10 421.9	1.130	$1,g$								1	16	<25
10 423.4	1.139	$0,u^+$	0	0	0	13	3	3	−3	0	16	70
		$0,u^+$	0	0	0	13	1	3	−1	0	16	30
10 424.2	1.134	$1,g$	0	1	0	5	−5	8	6	1	16	33
10 424.8	1.120	$2,u$								2	16	<25
10 426.9	1.120	$2,g$								2	16	<25
10 427.3	1.144	$0,u^+$	0	0	0	7	7	9	−7	0	16	59
10 427.6	1.139	$2,u$	0	0	0	13	3	3	−1	0	16	30
		$2,u$	0	0	0	13	−1	3	3	0	16	44
10 428.4	1.119	$0,g^+$	0	0	2	2	2	4	−2	2	16	34
10 429.0	1.141	$0,u^-$	0	0	0	11	−5	5	5	0	16	52
		$0,u^-$	0	0	0	11	−3	5	3	0	16	27
10 429.6	1.129	$1,u$	0	0	1	7	1	4	0	1	16	39
		$1,u$	0	0	1	7	−1	4	2	1	16	33
10 430.4	1.123	$2,u$	0	2	0	3	3	7	−1	2	16	29
		$2,u$	0	2	0	3	−3	7	5	2	16	26
10 431.2	1.137	$0,u^-$	0	0	0	15	−1	1	1	0	16	100
10 431.9	1.119	$2,g$								2	16	<25
10 432.0	1.118	$0,g^+$	2	0	0	4	0	2	0	2	16	33
10 432.8	1.131	$1,g$								1	16	<25
10 432.9	1.143	$0,g^+$	0	0	0	8	8	8	−8	0	16	28
		$0,g^+$	0	0	0	8	6	8	−6	0	16	35
10 434.0	1.141	$2,u$	0	0	0	11	5	5	−3	0	16	28
		$2,u$	0	0	0	11	−3	5	5	0	16	37
10 435.0	1.145	$2,g$	0	0	0	6	2	10	0	0	16	26
10 435.1	1.137	$2,u$	0	0	0	15	3	1	−1	0	16	40
		$2,u$	0	0	0	15	1	1	1	0	16	60
10 437.2	1.097	$0,g^+$	2	2	0	0	0	0	0	4	16	66
10 437.7	1.130	$1,g$	0	0	1	6	−2	5	3	1	16	31
10 438.2	1.100	$2,g$	1	3	0	0	0	2	2	4	16	87
10 440.2	1.134	$1,u$								1	16	<25
10 441.4	1.120	$0,u^-$	1	0	1	2	−2	4	2	2	16	39
10 441.7	1.122	$0,g^+$	0	1	1	3	3	5	−3	2	16	34
10 442.4	1.143	$2,g$	0	0	0	8	−6	8	8	0	16	36
10 442.4	1.118	$2,g$	2	0	0	4	0	2	2	2	16	25
10 442.8	1.130	$1,u$								1	16	<25
10 444.6	1.119	$2,g$	0	0	2	2	2	4	0	2	16	31
10 446.3	1.144	$2,u$	0	0	0	7	−7	9	9	0	16	39
10 446.6	1.120	$0,u^+$	1	1	0	3	1	5	−1	2	16	36
10 447.0	1.142	$0,u^+$	0	0	0	9	7	7	−7	0	16	32
		$0,u^+$	0	0	0	9	5	7	−5	0	16	39
10 449.3	1.111	$1,u$	0	2	1	1	1	4	0	3	16	42
		$1,u$	0	2	1	1	−1	4	2	3	16	43
10 449.5	1.119	$0,g^-$	0	0	2	2	−2	4	2	2	16	65
10 453.0	1.121	$2,g$								2	16	<25
10 454.2	1.142	$2,u$	0	0	0	9	−5	7	7	0	16	34
10 456.4	1.114	$1,g$	0	3	0	1	1	6	0	3	16	37
		$1,g$	0	3	0	1	−1	6	2	3	16	36
10 456.6	1.111	$0,u^+$	0	3	0	7	1	1	−1	3	17	94
10 456.7	1.121	$0,g^+$	1	1	0	4	0	4	0	2	16	25
10 457.1	1.131	$1,u$								1	16	<25
10 457.2	1.120	$2,u$								2	16	<25
10 459.5	1.111	$2,u$	0	3	0	7	3	1	−1	3	17	65
		$2,u$	0	3	0	7	1	1	1	3	17	30
10 460.2	1.122	$0,u^+$	0	2	0	3	3	7	−3	2	16	36
10 460.5	1.131	$1,g$	1	0	0	5	−5	6	6	1	16	32
10 462.4	1.120	$2,u$								2	16	<25
10 462.6	1.120	$2,g$								2	16	<25
10 462.6	1.145	$0,g^-$	0	0	0	6	−6	10	6	0	16	36
		$0,g^-$	0	0	0	6	−4	10	4	0	16	45

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 466.8	1.140	$0,g^-$	0	0	0	12	−4	4	4	0	16	41
		$0,g^-$	0	0	0	12	−2	4	2	0	16	59
10 467.5	1.120	$2,g$								2	16	<25
10 470.4	1.117	$0,u^+$	2	0	0	3	3	3	−3	2	16	38
10 471.7	1.130	$1,g$								1	16	<25
10 471.9	1.140	$2,g$	0	0	0	12	4	4	−2	0	16	33
		$2,g$	0	0	0	12	−2	4	4	0	16	33
10 472.1	1.132	$1,u$								1	16	<25
10 472.4	1.141	$0,g^+$	0	0	0	10	6	6	−6	0	16	28
		$0,g^+$	0	0	0	10	4	6	−4	0	16	52
10 472.9	1.120	$0,u^-$	1	1	0	3	−3	5	3	2	16	50
10 473.4	1.144	$0,u^-$	0	0	0	7	−7	9	7	0	16	56
		$0,u^-$	0	0	0	7	−3	9	3	0	16	33
10 473.5	1.131	$1,g$								1	16	<25
10 474.0	1.122	$2,u$								2	16	<25
10 474.0	1.138	$0,g^+$	0	0	0	14	2	2	−2	0	16	47
		$0,g^+$	0	0	0	14	0	2	0	0	16	53
10 474.8	1.133	$1,g$								1	16	<25
10 478.3	1.105	$1,g$	3	0	0	1	1	0	0	3	16	34
10 478.6	1.138	$2,g$	0	0	0	14	2	2	0	0	16	50
		$2,g$	0	0	0	14	0	2	2	0	16	35
10 478.8	1.141	$2,g$	0	0	0	10	−4	6	6	0	16	30
10 479.1	1.119	$0,g^+$	0	0	2	2	2	4	−2	2	16	30
		$0,g^+$	0	0	2	2	0	4	0	2	16	43
10 479.4	1.111	$1,u$	0	2	1	1	1	4	0	3	16	51
		$1,u$	0	2	1	1	−1	4	2	3	16	45
10 480.0	1.145	$2,g$								0	16	<25
10 482.5	1.120	$0,u^+$								2	16	<25
10 483.1	1.117	$0,u^-$	2	0	0	3	−3	3	3	2	16	51
		$0,u^-$	1	0	1	2	−2	4	2	2	16	35
10 486.8	1.134	$1,u$								1	16	<25
10 486.9	1.119	$2,u$	2	0	0	3	3	3	−1	2	16	26
		$2,u$	1	1	0	3	−3	5	5	2	16	26
10 487.5	1.144	$2,u$	0	0	0	7	−7	9	9	0	16	35
10 488.6	1.131	$1,g$								1	16	<25
10 489.3	1.143	$0,g^-$	0	0	0	8	−6	8	6	0	16	53
		$0,g^-$	0	0	0	8	−2	8	2	0	16	33
10 489.5	1.118	$2,u$	1	0	1	2	2	4	0	2	16	26
10 490.3	1.119	$2,g$	0	0	2	2	0	4	2	2	16	41
10 491.8	1.121	$0,g^-$	0	1	1	3	−1	5	1	2	16	81
10 491.9	1.108	$1,g$	3	0	0	1	1	0	0	3	16	25
10 492.8	1.131	$1,u$								1	16	<25
10 493.2	1.132	$1,g$	0	0	1	4	−4	7	5	1	16	26
10 494.8	1.132	$1,u$								1	16	<25
10 495.5	1.146	$0,u^+$	0	0	0	5	3	11	−3	0	16	35
		$0,u^+$	0	0	0	5	1	11	−1	0	16	54
10 495.6	1.120	$2,u$	1	0	1	2	−2	4	4	2	16	26
10 498.2	1.119	$1,g$	0	2	0	11	1	0	0	2	17	88
10 498.3	1.112	$1,g$	0	3	0	1	−1	6	2	3	16	33
10 498.9	1.143	$2,g$	0	0	0	8	−6	8	8	0	16	27
10 500.3	1.106	$1,g$	3	0	0	1	1	0	0	3	16	25
		$1,g$	2	0	1	0	0	1	1	3	16	26
10 500.6	1.130	$1,g$	0	0	1	6	0	5	1	1	16	41
10 501.2	1.120	$0,u^+$								2	16	<25
10 501.3	1.124	$0,g^+$	0	2	0	2	2	8	−2	2	16	34
		$0,g^+$	0	2	0	2	0	8	0	2	16	29
10 501.6	1.109	$1,u$	0	1	2	0	0	3	1	3	16	79
10 501.6	1.093	$0,g^+$	0	5	0	2	0	0	0	5	17	100
10 501.9	1.102	$1,u$	0	4	0	4	2	1	−1	4	17	64
		$1,u$	0	4	0	4	0	1	1	4	17	34
10 503.6	1.121	$2,g$	0	1	1	3	1	5	1	2	16	38
		$2,g$	0	1	1	3	−1	5	3	2	16	39
10 505.6	1.093	$2,g$	0	5	0	2	2	0	0	5	17	100
10 506.7	1.111	$0,u^-$	0	3	0	7	−1	1	1	3	17	96

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 509.4	1.118	$0,u^+$	1	0	1	2	0	4	0	2	16	40
10 509.5	1.131	$1,u$	0	0	1	5	3	6	−2	1	16	26
		$1,u$	0	0	1	5	−3	6	4	1	16	29
10 509.8	1.141	$0,u^+$	0	0	0	11	3	5	−3	0	16	62
10 511.0	1.131	$1,g$								1	16	<25
10 511.1	1.146	$2,u$	0	0	0	5	1	11	1	0	16	29
10 511.3	1.120	$0,u^+$								2	16	<25
10 511.7	1.111	$2,u$	0	3	0	7	3	1	−1	3	17	31
		$2,u$	0	3	0	7	1	1	1	3	17	66
10 511.8	1.145	$0,g^+$	0	0	0	6	6	10	−6	0	16	63
10 513.8	1.119	$2,u$								2	16	<25
10 515.2	1.142	$0,u^-$	0	0	0	9	−5	7	5	0	16	52
10 515.9	1.141	$2,u$	0	0	0	11	3	5	−1	0	16	26
		$2,u$	0	0	0	11	−1	5	3	0	16	27
10 515.9	1.121	$0,u^-$	1	1	0	3	−1	5	1	2	16	35
		$0,u^-$	0	2	0	3	−1	7	1	2	16	28
10 516.6	1.139	$0,u^-$	0	0	0	13	−1	3	1	0	16	79
10 517.1	1.124	$2,g$	0	2	0	2	0	8	2	2	16	30
10 518.9	1.119	$2,u$	1	0	1	2	0	4	2	2	16	34
10 520.1	1.108	$1,g$	2	1	0	1	1	2	0	3	16	29
10 521.9	1.139	$2,u$	0	0	0	13	3	3	−1	0	16	29
		$2,u$	0	0	0	13	1	3	1	0	16	47
10 523.1	1.142	$2,u$	0	0	0	9	5	7	−3	0	16	25
10 523.5	1.120	$1,u$	0	2	0	10	2	1	−1	2	17	51
		$1,u$	0	2	0	10	0	1	1	2	17	38
10 524.1	1.109	$1,g$	2	1	0	1	−1	2	2	3	16	36
10 524.7	1.121	$2,u$								2	16	<25
10 527.5	1.145	$2,g$	0	0	0	6	6	10	−4	0	16	27
		$2,g$	0	0	0	6	−6	10	8	0	16	36
10 527.6	1.121	$2,u$								2	16	<25
10 529.1	1.132	$1,g$								1	16	<25
10 530.3	1.119	$0,u^-$	2	0	0	3	−1	3	1	2	16	54
10 530.4	1.144	$0,u^+$	0	0	0	7	7	9	−7	0	16	32
		$0,u^+$	0	0	0	7	5	9	−5	0	16	39
10 532.2	1.108	$1,g$	1	1	1	0	0	3	1	3	16	71
10 532.7	1.132	$1,u$								1	16	<25
10 533.0	1.121	$0,g^+$	1	0	1	1	1	5	−1	2	16	37
10 534.5	1.102	$1,u$	0	4	0	4	2	1	−1	4	17	35
		$1,u$	0	4	0	4	0	1	1	4	17	64
10 535.9	1.112	$0,g^+$	0	3	0	6	2	2	−2	3	17	52
		$0,g^+$	0	3	0	6	0	2	0	3	17	42
10 537.4	1.112	$2,g$	0	3	0	6	4	2	−2	3	17	53
		$2,g$	0	3	0	6	2	2	0	3	17	33
10 539.2	1.133	$1,g$								1	16	<25
10 539.5	1.132	$1,u$								1	16	<25
10 539.6	1.122	$0,u^-$	0	1	1	2	−2	6	2	2	16	68
10 540.3	1.133	$1,u$								1	16	<25
10 541.8	1.119	$2,u$	2	0	0	3	1	3	1	2	16	31
10 542.2	1.144	$2,u$	0	0	0	7	−5	9	7	0	16	26
10 543.5	1.109	$1,g$	1	2	0	1	−1	4	2	3	16	26
10 546.9	1.120	$0,u^+$	0	0	2	1	1	5	−1	2	16	68
10 547.6	1.135	$1,g$	0	1	0	3	1	10	0	1	16	26
		$1,g$	0	1	0	3	−1	10	2	1	16	25
10 548.4	1.120	$2,g$								2	16	<25
10 548.4	1.146	$0,u^-$	0	0	0	5	−5	11	5	0	16	45
		$0,u^-$	0	0	0	5	−3	11	3	0	16	47
10 550.9	1.123	$0,g^-$	1	1	0	2	−2	6	2	2	16	30
		$0,g^-$	0	2	0	2	−2	8	2	2	16	56
10 552.4	1.141	$0,g^-$	0	0	0	10	−4	6	4	0	16	46
		$0,g^-$	0	0	0	10	−2	6	2	0	16	46
10 552.7	1.122	$2,u$	0	1	1	2	2	6	0	2	16	28
		$2,u$	0	1	1	2	−2	6	4	2	16	32
10 554.4	1.121	$0,u^-$	1	1	0	3	−1	5	1	2	16	46
10 557.2	1.143	$0,g^+$	0	0	0	8	6	8	−6	0	16	33

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,g^+$	0	0	0	8	4	8	−4	0	16	45
10 559.1	1.140	$0,g^+$	0	0	0	12	2	4	−2	0	16	49
		$0,g^+$	0	0	0	12	0	4	0	0	16	42
10 559.6	1.141	2,*g*	0	0	0	10	4	6	−2	0	16	28
		2,*g*	0	0	0	10	−2	6	4	0	16	31
10 559.8	1.132	1,*u*								1	16	<25
10 560.1	1.121	1,*g*	0	2	0	9	3	2	−2	2	17	32
		1,*g*	0	2	0	9	1	2	0	2	17	40
10 561.4	1.120	2,*u*	0	0	2	1	1	5	1	2	16	30
10 563.5	1.132	1,*g*								1	16	<25
10 564.2	1.146	2,*u*	0	0	0	5	−3	11	5	0	16	27
10 564.3	1.133	1,*u*	0	0	1	3	1	8	0	1	16	26
10 565.0	1.121	2,*u*								2	16	<25
10 565.2	1.140	2,*g*	0	0	0	12	2	4	0	0	16	38
		2,*g*	0	0	0	12	0	4	2	0	16	37
10 565.4	1.123	2,*g*	0	2	0	2	2	8	0	2	16	27
		2,*g*	0	2	0	2	−2	8	4	2	16	30
10 566.6	1.143	2,*g*	0	0	0	8	−4	8	6	0	16	29
10 569.1	1.121	$0,g^+$	1	1	0	2	2	6	−2	2	16	34
		$0,g^+$	1	1	0	2	0	6	0	2	16	26
10 570.3	1.145	$0,g^-$	0	0	0	6	−6	10	6	0	16	56
		$0,g^-$	0	0	0	6	−2	10	2	0	16	35
10 571.4	1.131	1,*u*	0	0	1	5	1	6	0	1	16	36
		1,*u*	0	0	1	5	−1	6	2	1	16	35
10 575.3	1.112	$0,g^-$	0	3	0	6	−2	2	2	3	17	96
10 576.5	1.121	$0,g^-$	2	0	0	2	−2	4	2	2	16	29
		$0,g^-$	1	0	1	1	−1	5	1	2	16	27
		$0,g^-$	0	2	0	2	−2	8	2	2	16	30
10 577.6	1.120	$0,u^-$	0	0	2	1	−1	5	1	2	16	75
10 578.8	1.132	1,*u*								1	16	<25
10 579.2	1.112	2,*g*	0	3	0	6	4	2	−2	3	17	36
		2,*g*	0	3	0	6	0	2	2	3	17	43
10 580.1	1.109	$0,u^+$	0	2	1	6	0	0	0	3	17	93
10 580.8	1.132	1,*g*	0	0	1	4	2	7	−1	1	16	27
		1,*g*	0	0	1	4	−2	7	3	1	16	32
10 583.5	1.147	$0,g^+$	0	0	0	4	2	12	−2	0	16	49
		$0,g^+$	0	0	0	4	0	12	0	0	16	33
10 583.6	1.121	2,*g*	1	1	0	2	0	6	2	2	16	26
10 583.7	1.145	2,*g*	0	0	0	6	6	10	−4	0	16	25
		2,*g*	0	0	0	6	−6	10	8	0	16	31
10 584.1	1.109	2,*u*	0	2	1	6	2	0	0	3	17	94
10 586.6	1.118	$0,g^+$	2	0	0	2	2	4	−2	2	16	37
		$0,g^+$	1	0	1	1	1	5	−1	2	16	33
10 588.6	1.122	$0,u^+$	0	1	1	2	2	6	−2	2	16	43
		$0,u^+$	0	1	1	2	0	6	0	2	16	54
10 590.0	1.120	2,*u*	0	0	2	1	1	5	1	2	16	33
		2,*u*	0	0	2	1	−1	5	3	2	16	37
10 590.4	1.121	2,*g*								2	16	<25
10 591.5	1.120	1,*u*	0	2	0	10	2	1	−1	2	17	39
		1,*u*	0	2	0	10	0	1	1	2	17	51
10 594.6	1.142	$0,u^+$	0	0	0	9	5	7	−5	0	16	26
		$0,u^+$	0	0	0	9	3	7	−3	0	16	57
10 598.6	1.144	$0,u^-$	0	0	0	7	−5	9	5	0	16	52
10 598.8	1.147	2,*g*	0	0	0	4	2	12	0	0	16	27
		2,*g*	0	0	0	4	0	12	2	0	16	33
10 598.8	1.133	1,*g*	1	0	0	3	1	8	0	1	16	26
10 599.7	1.133	1,*u*								1	16	<25
10 601.4	1.141	$0,u^-$	0	0	0	11	−3	5	3	0	16	27
		$0,u^-$	0	0	0	11	−1	5	1	0	16	71
10 601.6	1.122	2,*u*	0	1	1	2	0	6	2	2	16	50
10 601.8	1.118	2,*g*								2	16	<25
10 601.9	1.112	1,*g*	0	2	1	0	0	5	1	3	16	96
10 602.9	1.142	2,*u*	0	0	0	9	3	7	−1	0	16	26
		2,*u*	0	0	0	9	−3	7	5	0	16	28

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 604.2	1.135	1,*g*	0	1	0	3	3	10	−2	1	16	29
		1,*g*	0	1	0	3	−3	10	4	1	16	28
10 606.0	1.134	1,*u*								1	16	<25
10 606.0	1.121	0,g^-	1	1	0	2	−2	6	2	2	16	60
10 607.5	1.132	1,*g*								1	16	<25
10 608.1	1.122	1,*u*	0	2	0	8	2	3	−1	2	17	34
10 608.2	1.141	2,*u*	0	0	0	11	1	5	1	0	16	40
		2,*u*	0	0	0	11	−1	5	3	0	16	26
10 608.8	1.123	0,g^+								2	16	<25
10 609.0	1.146	0,u^+	0	0	0	5	5	11	−5	0	16	69
		0,u^+	0	0	0	5	1	11	−1	0	16	28
10 609.4	1.144	2,*u*	0	0	0	7	5	9	−3	0	16	26
		2,*u*	0	0	0	7	−5	9	7	0	16	26
10 610.7	1.118	0,g^-	2	0	0	2	−2	4	2	2	16	37
		0,g^-	1	0	1	1	−1	5	1	2	16	56
10 615.1	1.114	1,*u*	1	2	0	0	0	5	1	3	16	29
		1,*u*	0	3	0	0	0	7	1	3	16	63
10 617.2	1.109	0,g^+	1	2	0	6	0	0	0	3	17	60
10 617.6	1.121	1,*g*	0	2	0	9	3	2	−2	2	17	44
		1,*g*	0	2	0	9	−1	2	2	2	17	45
10 618.7	1.121	2,*g*	1	1	0	2	−2	6	4	2	16	35
10 621.7	1.122	2,*g*								2	16	<25
10 621.9	1.109	2,*g*	1	2	0	6	2	0	0	3	17	68
10 622.3	1.119	2,*g*	1	0	1	1	1	5	1	2	16	27
10 623.0	1.104	1,*u*	3	0	0	0	0	1	1	3	16	83
10 623.4	1.146	2,*u*	0	0	0	5	5	11	−3	0	16	31
		2,*u*	0	0	0	5	−5	11	7	0	16	38
10 623.9	1.103	1,*g*	0	4	0	3	3	2	−2	4	17	54
		1,*g*	0	4	0	3	1	2	0	4	17	32
10 625.7	1.111	0,g^+	0	3	0	6	2	2	−2	3	17	28
		0,g^+	0	3	0	6	0	2	0	3	17	47
10 626.8	1.113	2,*u*	0	3	0	5	5	3	−3	3	17	54
		2,*u*	0	3	0	5	3	3	−1	3	17	28
10 627.0	1.117	1,*u*	0	1	1	9	1	0	0	2	17	83
10 627.2	1.113	0,u^+	0	3	0	5	3	3	−3	3	17	32
		0,u^+	0	3	0	5	1	3	−1	3	17	60
10 628.4	1.120	0,g^+	2	0	0	2	0	4	0	2	16	36
10 630.8	1.133	1,*g*								1	16	<25
10 631.3	1.112	2,*g*	0	3	0	6	2	2	0	3	17	45
		2,*g*	0	3	0	6	0	2	2	3	17	34
10 634.0	1.133	1,*u*								1	16	<25
10 636.5	1.143	0,g^-	0	0	0	8	−4	8	4	0	16	47
		0,g^-	0	0	0	8	−2	8	2	0	16	43
10 637.3	1.123	0,g^+	0	1	1	1	1	7	−1	2	16	78
10 639.2	1.145	0,g^+	0	0	0	6	6	10	−6	0	16	28
		0,g^+	0	0	0	6	4	10	−4	0	16	52
10 640.7	1.124	0,u^+	1	1	0	1	1	7	−1	2	16	30
		0,u^+	0	2	0	1	1	9	−1	2	16	58
10 640.8	1.120	2,*g*	2	0	0	2	0	4	2	2	16	35
10 642.0	1.132	1,*g*	0	0	1	4	0	7	1	1	16	42
10 643.5	1.141	0,g^+	0	0	0	10	2	6	−2	0	16	49
		0,g^+	0	0	0	10	0	6	0	0	16	38
10 645.1	1.100	1,*u*	0	3	1	3	1	0	0	4	17	98
10 645.6	1.103	1,*g*	0	4	0	3	3	2	−2	4	17	36
		1,*g*	0	4	0	3	−1	2	2	4	17	48
10 645.8	1.143	2,*g*	0	0	0	8	4	8	−2	0	16	26
		2,*g*	0	0	0	8	−2	8	4	0	16	27
10 646.7	1.147	0,g^-	0	0	0	4	−4	12	4	0	16	59
		0,g^-	0	0	0	4	−2	12	2	0	16	41
10 647.0	1.133	1,*g*	1	0	0	3	3	8	−2	1	16	27
		1,*g*	1	0	0	3	−3	8	4	1	16	30
10 648.0	1.110	1,*u*	2	1	0	0	0	3	1	3	16	39
		1,*u*	1	2	0	0	0	5	1	3	16	27
10 649.5	1.117	1,*g*								2	17	<25

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 651.1	1.141	2,*g*	0	0	0	10	2	6	0	0	16	32
		2,*g*	0	0	0	10	0	6	2	0	16	36
10 651.3	1.145	2,*g*	0	0	0	6	−4	10	6	0	16	29
10 651.6	1.133	1,*u*	0	0	1	3	3	8	−2	1	16	28
		1,*u*	0	0	1	3	−3	8	4	1	16	31
10 651.6	1.123	2,*g*	0	1	1	1	1	7	1	2	16	35
		2,*g*	0	1	1	1	−1	7	3	2	16	41
10 652.9	1.122	$0,g^+$	1	1	0	2	0	6	0	2	16	33
10 655.2	1.122	1,*u*	0	2	0	8	4	3	−3	2	17	40
		1,*u*	0	2	0	8	−2	3	3	2	17	30
10 655.6	1.124	2,*u*	0	2	0	1	1	9	1	2	16	30
		2,*u*	0	2	0	1	−1	9	3	2	16	29
10 655.6	1.093	$0,u^+$	0	5	0	1	1	1	−1	5	17	99
10 656.0	1.113	$0,u^-$	0	3	0	5	−3	3	3	3	17	79
10 657.9	1.113	2,*u*	0	3	0	5	5	3	−3	3	17	33
		2,*u*	0	3	0	5	1	3	1	3	17	33
10 661.6	1.147	2,*g*	0	0	0	4	4	12	−2	0	16	29
		2,*g*	0	0	0	4	−4	12	6	0	16	30
10 663.7	1.122	2,*g*	1	1	0	2	0	6	2	2	16	33
10 665.5	1.109	$0,g^+$	0	2	1	5	1	1	−1	3	17	74
10 667.2	1.136	1,*u*	0	1	0	2	0	11	1	1	16	33
10 667.4	1.109	2,*g*	0	2	1	5	3	1	−1	3	17	59
10 667.7	1.123	1,*g*	0	2	0	7	3	4	−2	2	17	28
10 668.0	1.134	1,*g*								1	16	<25
10 668.5	1.093	$0,u^-$	0	5	0	1	−1	1	1	5	17	100
10 671.2	1.121	$0,u^+$	2	0	0	1	1	5	−1	2	16	29
		$0,u^+$	1	0	1	0	0	6	0	2	16	27
		$0,u^+$	0	2	0	1	1	9	−1	2	16	28
10 672.1	1.110	1,*u*	2	1	0	0	0	3	1	3	16	42
		1,*u*	1	2	0	0	0	5	1	3	16	44
10 673.2	1.134	1,*g*	0	0	1	2	0	9	1	1	16	30
10 675.0	1.133	1,*u*								1	16	<25
10 675.1	1.103	1,*g*	0	4	0	3	1	2	0	4	17	45
		1,*g*	0	4	0	3	−1	2	2	4	17	39
10 675.8	1.093	2,*u*	0	5	0	1	1	1	1	5	17	100
10 676.0	1.121	$0,g^+$	0	0	2	0	0	6	0	2	16	77
10 678.0	1.144	$0,u^+$	0	0	0	7	5	9	−5	0	16	26
		$0,u^+$	0	0	0	7	3	9	−3	0	16	57
10 679.2	1.146	$0,u^-$	0	0	0	5	−5	11	5	0	16	52
		$0,u^-$	0	0	0	5	−3	11	3	0	16	27
10 683.2	1.120	1,*g*	0	2	0	9	1	2	0	2	17	45
10 683.5	1.148	$0,u^+$	0	0	0	3	3	13	−3	0	16	30
		$0,u^+$	0	0	0	3	1	13	−1	0	16	70
10 685.1	1.123	$0,g^-$	0	1	1	1	−1	7	1	2	16	96
10 685.5	1.142	$0,u^-$	0	0	0	9	−3	7	3	0	16	28
		$0,u^-$	0	0	0	9	−1	7	1	0	16	67
10 685.6	1.121	2,*u*	1	0	1	0	0	6	2	2	16	28
10 686.0	1.118	1,*u*								2	17	<25
10 688.3	1.144	2,*u*	0	0	0	7	3	9	−1	0	16	27
		2,*u*	0	0	0	7	−3	9	5	0	16	29
10 689.3	1.121	2,*g*	0	0	2	0	0	6	2	2	16	73
10 689.5	1.118	1,*g*	1	1	0	9	1	0	0	2	17	32
10 689.8	1.112	$0,u^+$	0	3	0	5	3	3	−3	3	17	51
10 690.6	1.100	1,*g*	1	3	0	3	1	0	0	4	17	86
10 692.2	1.146	2,*u*	0	0	0	5	−5	11	7	0	16	27
10 693.9	1.142	2,*u*	0	0	0	9	1	7	1	0	16	37
		2,*u*	0	0	0	9	−1	7	3	0	16	29
10 695.6	1.111	2,*u*	0	3	0	5	−1	3	3	3	17	34
10 698.4	1.148	2,*u*	0	0	0	3	1	13	1	0	16	36
		2,*u*	0	0	0	3	−1	13	3	0	16	34
10 698.5	1.110	$0,u^+$	1	2	0	5	1	1	−1	3	17	39
10 698.7	1.123	2,*g*	0	1	1	1	1	7	1	2	16	39
		2,*g*	0	1	1	1	−1	7	3	2	16	52
10 698.9	1.130	$0,g^+$	0	1	0	12	2	2	−2	1	17	43

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,g^+$	0	1	0	12	0	2	0	1	17	38
10 699.9	1.110	$0,g^-$	0	2	1	5	−1	1	1	3	17	95
10 701.1	1.130	$2,g$	0	1	0	12	4	2	−2	1	17	34
		$2,g$	0	1	0	12	2	2	0	1	17	36
10 701.1	1.124	$0,u^-$	1	1	0	1	−1	7	1	2	16	39
		$0,u^-$	0	2	0	1	−1	9	1	2	16	51
10 701.7	1.133	$1,u$								1	16	<25
10 701.7	1.129	$0,u^+$	0	1	0	11	1	3	−1	1	17	28
		$0,u^+$	0	1	0	13	1	1	−1	1	17	41
10 702.3	1.110	$2,u$	0	3	0	5	3	3	−1	3	17	25
10 703.8	1.130	$2,u$								1	17	<25
10 704.0	1.122	$0,u^+$	1	1	0	1	1	7	−1	2	16	58
10 704.3	1.133	$1,g$								1	16	<25
10 704.6	1.123	$1,g$	0	2	0	7	5	4	−4	2	17	37
10 705.5	1.110	$2,g$	0	2	1	5	3	1	−1	3	17	27
		$2,g$	0	2	1	5	1	1	1	3	17	66
10 706.1	1.116	$1,g$	0	0	2	7	1	0	0	2	17	69
10 708.7	1.130	$0,u^+$	0	1	0	11	1	3	−1	1	17	32
		$0,u^+$	0	1	0	13	1	1	−1	1	17	42
10 709.2	1.107	$0,g^+$	0	1	2	4	0	0	0	3	17	67
10 710.6	1.122	$1,u$	0	2	0	8	2	3	−1	2	17	26
		$1,u$	0	2	0	8	−2	3	3	2	17	36
10 710.7	1.129	$2,u$	0	1	0	13	3	1	−1	1	17	33
10 712.3	1.133	$1,u$	0	0	1	3	1	8	0	1	16	38
		$1,u$	0	0	1	3	−1	8	2	1	16	38
10 713.2	1.119	$0,u^+$	2	0	0	1	1	5	−1	2	16	46
		$0,u^+$	1	0	1	0	0	6	0	2	16	45
10 713.3	1.107	$2,g$	0	1	2	4	2	0	0	3	17	68
10 714.7	1.124	$2,u$	0	2	0	1	−1	9	3	2	16	28
10 715.3	1.134	$1,u$	1	0	0	2	0	9	1	1	16	32
10 717.7	1.122	$2,u$	1	1	0	1	1	7	1	2	16	26
		$2,u$	1	1	0	1	−1	7	3	2	16	32
10 718.6	1.147	$0,g^+$	0	0	0	4	4	12	−4	0	16	74
10 719.2	1.145	$0,g^-$	0	0	0	6	−4	10	4	0	16	46
		$0,g^-$	0	0	0	6	−2	10	2	0	16	46
10 721.5	1.128	$0,g^+$	0	1	0	14	0	0	0	1	17	71
10 721.9	1.134	$1,g$	0	0	1	2	2	9	−1	1	16	43
		$1,g$	0	0	1	2	−2	9	3	1	16	47
10 722.4	1.118	$1,g$	0	1	1	8	2	1	−1	2	17	34
		$1,g$	0	1	1	8	0	1	1	2	17	52
10 722.9	1.131	$2,g$	0	1	0	10	4	4	−2	1	17	29
10 723.5	1.131	$0,g^+$	0	1	0	10	2	4	−2	1	17	38
10 725.4	1.128	$2,g$	0	1	0	14	2	0	0	1	17	74
10 725.4	1.117	$1,u$	1	0	1	7	1	0	0	2	17	61
10 726.4	1.121	$0,u^-$	2	0	0	1	−1	5	1	2	16	57
		$0,u^-$	0	2	0	1	−1	9	1	2	16	29
10 726.9	1.119	$2,u$	2	0	0	1	−1	5	3	2	16	31
		$2,u$	1	0	1	0	0	6	2	2	16	43
10 727.2	1.143	$0,g^+$	0	0	0	8	2	8	−2	0	16	49
		$0,g^+$	0	0	0	8	0	8	0	0	16	37
10 729.6	1.107	$0,u^+$	1	1	1	4	0	0	0	3	17	46
10 730.3	1.145	$2,g$	0	0	0	6	−2	10	4	0	16	26
10 731.2	1.114	$0,g^+$	0	3	0	4	2	4	−2	3	17	41
10 732.3	1.147	$2,g$	0	0	0	4	4	12	−2	0	16	35
		$2,g$	0	0	0	4	−4	12	6	0	16	39
10 733.4	1.107	$2,u$	1	1	1	4	2	0	0	3	17	49
10 733.8	1.111	$0,u^-$	1	2	0	5	−1	1	1	3	17	42
		$0,u^-$	0	3	0	5	−1	3	1	3	17	39
10 734.0	1.136	$1,u$	0	1	0	2	2	11	−1	1	16	32
		$1,u$	0	1	0	2	−2	11	3	1	16	33
10 734.9	1.118	$1,g$								2	17	<25
10 736.4	1.143	$2,g$	0	0	0	8	2	8	0	0	16	29
		$2,g$	0	0	0	8	0	8	2	0	16	36
10 738.3	1.118	$1,u$								2	17	<25

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 739.5	1.121	2,u	2	0	0	1	1	5	1	2	16	32
10 739.9	1.123	1,u								2	17	<25
10 741.0	1.111	2,u	1	2	0	5	1	1	1	3	17	38
10 742.3	1.134	1,g								1	16	<25
10 745.4	1.114	2,g	0	3	0	4	4	4	−2	3	17	35
		2,g	0	3	0	4	2	4	0	3	17	32
10 746.8	1.118	1,u								2	17	<25
10 746.8	1.111	0,u^-	1	2	0	5	−1	1	1	3	17	42
		0,u^-	0	3	0	5	−1	3	1	3	17	44
10 749.2	1.122	1,g	0	2	0	7	−3	4	4	2	17	32
10 749.8	1.114	0,g^-	0	3	0	4	−4	4	4	3	17	69
10 750.0	1.132	2,u	0	1	0	9	5	5	−3	1	17	28
10 751.8	1.132	0,u^+	0	1	0	9	3	5	−3	1	17	30
		0,u^+	0	1	0	9	1	5	−1	1	17	45
10 752.3	1.122	0,u^-	1	1	0	1	−1	7	1	2	16	56
10 752.5	1.111	2,u	0	3	0	5	1	3	1	3	17	32
10 756.7	1.109	2,u	0	2	1	4	4	2	−2	3	17	33
10 756.9	1.107	0,u^+	0	0	3	2	0	0	0	3	17	27
10 757.4	1.148	0,u^-	0	0	0	3	−3	13	3	0	16	79
10 760.0	1.146	0,u^+	0	0	0	5	3	11	−3	0	16	62
10 761.2	1.105	0,g^+	1	0	2	2	0	0	0	3	17	74
10 761.3	1.109	0,u^+	0	2	1	4	2	2	−2	3	17	29
10 761.6	1.107	2,u	0	0	3	2	2	0	0	3	17	31
10 763.1	1.117	1,u	0	0	2	6	2	1	−1	2	17	35
10 763.8	1.105	2,g	1	0	2	2	2	0	0	3	17	78
10 764.3	1.122	2,u	1	1	0	1	1	7	1	2	16	27
		2,u	1	1	0	1	−1	7	3	2	16	29
10 766.1	1.123	1,u	0	2	0	6	6	5	−5	2	17	37
10 767.4	1.104	1,u	0	4	0	2	2	3	−1	4	17	35
		1,u	0	4	0	2	0	3	1	4	17	38
10 768.2	1.131	0,u^-	0	1	0	11	−3	3	3	1	17	67
10 768.9	1.144	0,u^-	0	0	0	7	−3	9	3	0	16	28
		0,u^-	0	0	0	7	−1	9	1	0	16	67
10 769.4	1.101	1,g	0	3	1	2	2	1	−1	4	17	69
10 771.2	1.131	2,u	0	1	0	11	5	3	−3	1	17	37
10 771.2	1.130	0,g^-	0	1	0	12	−2	2	2	1	17	57
10 771.5	1.148	2,u	0	0	0	3	3	13	−1	0	16	39
		2,u	0	0	0	3	−3	13	5	0	16	40
10 771.9	1.146	2,u	0	0	0	5	3	11	−1	0	16	31
		2,u	0	0	0	5	−3	11	5	0	16	32
10 771.9	1.114	0,g^+	0	3	0	4	4	4	−4	3	17	66
10 772.6	1.134	1,g								1	16	<25
10 774.2	1.121	1,u	0	2	0	8	0	3	1	2	17	37
10 774.4	1.134	1,u	1	0	0	2	2	9	−1	1	16	31
		1,u	1	0	0	2	−2	9	3	1	16	35
10 774.4	1.130	2,g								1	17	<25
10 776.6	1.118	1,g	1	0	1	6	2	1	−1	2	17	25
10 777.6	1.131	0,g^-	0	1	0	10	−4	4	4	1	17	38
		0,g^-	0	1	0	12	−2	2	2	1	17	28
10 778.0	1.114	2,g	0	3	0	4	4	4	−2	3	17	31
		2,g	0	3	0	4	0	4	2	3	17	27
		2,g	0	3	0	4	−2	4	4	3	17	30
10 778.7	1.144	2,u	0	0	0	7	1	9	1	0	16	36
		2,u	0	0	0	7	−1	9	3	0	16	31
10 779.9	1.131	2,g								1	17	<25
10 781.2	1.124	0,u^+	0	1	1	0	0	8	0	2	16	95
10 782.5	1.134	1,g	0	0	1	2	0	9	1	1	16	51
10 783.9	1.119	1,u								2	17	<25
10 784.1	1.119	1,g								2	17	<25
10 784.5	1.110	0,u^-	0	2	1	4	−2	2	2	3	17	77
10 787.4	1.104	1,u	0	4	0	2	2	3	−1	4	17	37
		1,u	0	4	0	2	−2	3	3	4	17	58
10 789.0	1.129	0,u^-	0	1	0	13	−1	1	1	1	17	81
10 789.4	1.133	2,g	0	1	0	8	8	6	−6	1	17	30

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		2,*g*	0	1	0	8	6	6	−4	1	17	25
10 789.4	1.110	2,*u*	0	2	1	4	2	2	0	3	17	29
		2,*u*	0	2	1	4	0	2	2	3	17	31
10 790.2	1.101	1,*g*	0	3	1	2	2	1	−1	4	17	25
		1,*g*	0	3	1	2	0	1	1	4	17	73
10 791.6	1.135	1,*u*	0	0	1	1	1	10	0	1	16	45
		1,*u*	0	0	1	1	−1	10	2	1	16	46
10 791.8	1.110	$0,g^+$	1	2	0	4	2	2	−2	3	17	31
10 792.3	1.133	$0,g^+$	0	1	0	8	2	6	−2	1	17	32
10 792.7	1.125	$0,g^+$	1	1	0	0	0	8	0	2	16	37
		$0,g^+$	0	2	0	0	0	10	0	2	16	56
10 793.2	1.129	2,*u*	0	1	0	13	3	1	−1	1	17	30
		2,*u*	0	1	0	13	1	1	1	1	17	48
10 794.3	1.110	2,*g*	1	2	0	4	4	2	−2	3	17	38
10 794.6	1.128	$0,g^+$	0	0	1	11	1	1	−1	1	17	77
10 794.7	1.132	2,*u*	0	1	0	9	7	5	−5	1	17	32
10 794.9	1.124	2,*u*	0	1	1	0	0	8	2	2	16	94
10 795.0	1.132	$0,u^-$	0	1	0	9	−5	5	5	1	17	42
		$0,u^-$	0	1	0	9	−3	5	3	1	17	39
10 795.6	1.121	1,*u*								2	17	<25
10 795.6	1.119	1,*g*								2	17	<25
10 795.6	1.149	$0,g^+$	0	0	0	2	2	14	−2	0	16	53
		$0,g^+$	0	0	0	2	0	14	0	0	16	47
10 795.9	1.128	$0,u^+$	0	0	1	10	2	2	−2	1	17	32
		$0,u^+$	0	0	1	10	0	2	0	1	17	29
10 797.0	1.128	2,*g*	0	0	1	11	3	1	−1	1	17	51
		2,*g*	0	0	1	11	1	1	1	1	17	30
10 798.3	1.128	2,*u*	0	0	1	10	4	2	−2	1	17	26
10 798.8	1.137	1,*g*	0	1	0	1	1	12	0	1	16	34
		1,*g*	0	1	0	1	−1	12	2	1	16	34
10 799.8	1.117	1,*u*	0	0	2	6	2	1	−1	2	17	27
		1,*u*	0	0	2	6	0	1	1	2	17	42
10 800.4	1.147	$0,g^-$	0	0	0	4	−4	12	4	0	16	41
		$0,g^-$	0	0	0	4	−2	12	2	0	16	59
10 801.8	1.121	1,*u*								2	17	<25
10 803.0	1.122	1,*g*	0	2	0	7	3	4	−2	2	17	31
10 804.3	1.113	$0,g^-$	0	3	0	4	−2	4	2	3	17	51
10 804.7	1.127	$0,u^+$	0	0	1	12	0	0	0	1	17	80
10 807.0	1.125	2,*g*	1	1	0	0	0	8	2	2	16	36
		2,*g*	0	2	0	0	0	10	2	2	16	56
10 807.6	1.127	2,*u*	0	0	1	12	2	0	0	1	17	84
10 809.3	1.135	1,*u*	0	1	0	2	0	11	1	1	16	30
10 810.0	1.149	2,*g*	0	0	0	2	2	14	0	0	16	27
		2,*g*	0	0	0	2	0	14	2	0	16	47
		2,*g*	0	0	0	2	−2	14	4	0	16	25
10 810.3	1.145	$0,g^+$	0	0	0	6	2	10	−2	0	16	49
		$0,g^+$	0	0	0	6	0	10	0	0	16	38
10 811.9	1.129	$0,g^+$	0	0	1	9	1	3	−1	1	17	42
10 812.7	1.129	2,*g*								1	17	<25
10 813.0	1.147	2,*g*	0	0	0	4	2	12	0	0	16	29
		2,*g*	0	0	0	4	−2	12	4	0	16	31
10 813.4	1.113	2,*g*	0	3	0	4	−2	4	4	3	17	42
10 813.5	1.108	$0,u^+$	0	1	2	3	1	1	−1	3	17	66
10 814.5	1.101	1,*u*	1	3	0	2	2	1	−1	4	17	35
		1,*u*	1	3	0	2	0	1	1	4	17	33
10 814.8	1.103	1,*u*	1	3	0	2	2	1	−1	4	17	29
		1,*u*	0	4	0	2	0	3	1	4	17	46
10 814.8	1.108	2,*u*	0	1	2	3	3	1	−1	3	17	61
10 816.5	1.091	$0,u^+$	0	4	1	0	0	0	0	5	17	99
10 817.2	1.119	1,*u*	0	1	1	7	1	2	0	2	17	46
		1,*u*	0	1	1	7	−1	2	2	2	17	30
10 819.2	1.111	$0,u^+$	0	2	1	4	2	2	−2	3	17	44
		$0,u^+$	0	2	1	4	0	2	0	3	17	50
10 820.0	1.118	1,*g*	1	0	1	6	0	1	1	2	17	37

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 820.9	1.145	2,g	0	0	0	6	2	10	0	0	16	27
		2,g	0	0	0	6	0	10	2	0	16	38
10 822.9	1.133	2,g	0	1	0	8	8	6	−6	1	17	36
10 823.2	1.110	0,g^-	1	2	0	4	−2	2	2	3	17	52
10 824.1	1.122	0,g^+	2	0	0	0	0	6	0	2	16	53
		0,g^+	0	2	0	0	0	10	0	2	16	29
10 826.3	1.111	2,u	0	2	1	4	2	2	0	3	17	43
		2,u	0	2	1	4	0	2	2	3	17	44
10 826.3	1.133	0,g^-	0	1	0	8	−6	6	6	1	17	36
		0,g^-	0	1	0	8	−4	6	4	1	17	38
10 826.4	1.110	2,g								3	17	<25
10 827.8	1.119	1,g								2	17	<25
10 830.8	1.108	0,g^+	1	1	1	3	1	1	−1	3	17	50
10 831.2	1.119	1,g	1	1	0	7	−1	2	2	2	17	29
10 831.5	1.108	0,u^-	0	1	2	3	−1	1	1	3	17	72
10 831.8	1.094	0,g^+	0	5	0	0	0	2	0	5	17	95
10 832.0	1.123	1,g								2	17	<25
10 832.9	1.120	1,u								2	17	<25
10 834.7	1.130	0,u^+								1	17	<25
10 834.9	1.108	2,g	1	1	1	3	3	1	−1	3	17	55
10 835.2	1.130	2,u								1	17	<25
10 835.9	1.098	1,g	0	2	2	1	1	0	0	4	17	82
10 836.0	1.131	0,g^+	0	1	0	10	4	4	−4	1	17	63
10 837.9	1.122	2,g	2	0	0	0	0	6	2	2	16	53
		2,g	0	2	0	0	0	10	2	2	16	28
10 838.1	1.108	2,u	0	1	2	3	1	1	1	3	17	60
10 838.3	1.101	1,u	1	3	0	2	0	1	1	4	17	60
10 839.3	1.131	0,u^+	0	1	0	11	3	3	−3	1	17	44
10 840.1	1.131	2,g	0	1	0	10	−2	4	4	1	17	31
10 840.4	1.148	0,u^+	0	0	0	3	3	13	−3	0	16	70
		0,u^+	0	0	0	3	1	13	−1	0	16	30
10 841.6	1.119	1,u								2	17	<25
10 843.0	1.119	1,g								2	17	<25
10 843.5	1.135	1,u	1	0	0	2	0	9	1	1	16	29
10 843.6	1.131	2,u	0	1	0	11	−1	3	3	1	17	27
10 844.1	1.122	1,u								2	17	<25
10 844.2	1.135	1,g	1	0	0	1	1	10	0	1	16	34
		1,g	1	0	0	1	−1	10	2	1	16	33
10 845.2	1.132	0,u^+	0	1	0	9	5	5	−5	1	17	47
10 847.0	1.094	2,g	0	5	0	0	0	2	2	5	17	100
10 847.1	1.134	0,u^+	0	1	0	7	1	7	−1	1	17	30
10 848.0	1.112	0,g^+	0	3	0	4	2	4	−2	3	17	28
		0,g^+	0	3	0	4	0	4	0	3	17	26
10 848.6	1.132	2,u								1	17	<25
10 850.6	1.116	1,g	2	0	0	7	1	0	0	2	17	64
10 851.6	1.146	0,u^-	0	0	0	5	−3	11	3	0	16	27
		0,u^-	0	0	0	5	−1	11	1	0	16	71
10 852.4	1.135	1,u	0	0	1	1	1	10	0	1	16	46
		1,u	0	0	1	1	−1	10	2	1	16	48
10 852.5	1.122	0,g^+	2	0	0	0	0	6	0	2	16	29
		0,g^+	1	1	0	0	0	8	0	2	16	53
10 853.3	1.114	0,u^+	0	3	0	3	3	5	−3	3	17	28
		0,u^+	0	3	0	3	1	5	−1	3	17	53
10 853.6	1.148	2,u	0	0	0	3	3	13	−1	0	16	34
		2,u	0	0	0	3	−3	13	5	0	16	36
10 854.1	1.108	0,g^-	1	1	1	3	−1	1	1	3	17	58
10 855.2	1.129	0,g^+	0	1	0	12	2	2	−2	1	17	35
		0,g^+	0	1	0	12	0	2	0	1	17	40
10 856.1	1.134	2,u								1	17	<25
10 856.5	1.108	2,g								3	17	<25
10 857.0	1.112	2,g								3	17	<25
10 857.2	1.128	2,u	1	0	0	11	3	1	−1	1	17	31
		2,u	1	0	0	11	1	1	1	1	17	25
		2,u	0	0	1	10	4	2	−2	1	17	25

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 857.2	1.108	$0,g^+$	2	1	0	4	0	0	0	3	17	33
10 858.1	1.127	$0,u^+$	1	0	0	11	1	1	−1	1	17	70
10 858.2	1.119	$1,g$								2	17	<25
10 859.8	1.129	$2,g$	0	1	0	12	2	2	0	1	17	29
10 860.2	1.123	$1,g$								2	17	<25
10 860.8	1.098	$1,u$	1	2	1	1	1	0	0	4	17	92
10 861.3	1.127	$0,g^+$	1	0	0	12	0	0	0	1	17	68
10 862.4	1.128	$0,u^-$	0	0	1	10	−2	2	2	1	17	85
10 862.6	1.129	$2,g$	0	0	1	9	5	3	−3	1	17	25
10 862.8	1.146	$2,u$	0	0	0	5	1	11	1	0	16	37
		$2,u$	0	0	0	5	−1	11	3	0	16	34
10 863.0	1.128	$2,g$	1	0	0	12	2	0	0	1	17	40
10 863.4	1.133	$0,g^+$	0	1	0	8	6	6	−6	1	17	57
10 864.1	1.120	$1,u$	0	1	1	5	5	4	−4	2	17	25
10 864.7	1.122	$1,g$	0	2	0	7	1	4	0	2	17	32
10 864.9	1.129	$0,g^-$	0	0	1	9	−3	3	3	1	17	39
		$0,g^-$	0	0	1	11	−1	1	1	1	17	31
10 865.5	1.122	$2,g$	2	0	0	0	0	6	2	2	16	29
		$2,g$	1	1	0	0	0	8	2	2	16	53
10 865.6	1.132	$2,g$								1	17	<25
10 865.7	1.090	$0,g^+$	1	4	0	0	0	0	0	5	17	95
10 865.9	1.109	$0,g^+$								3	17	<25
10 866.6	1.108	$2,g$	2	1	0	4	2	0	0	3	17	40
10 867.9	1.129	$0,g^+$	1	0	0	10	2	2	−2	1	17	29
		$0,g^+$	1	0	0	10	0	2	0	1	17	26
10 868.1	1.128	$2,u$	0	0	1	10	0	2	2	1	17	39
10 868.7	1.106	$0,u^+$	1	0	2	1	1	1	−1	3	17	76
10 869.1	1.109	$0,g^+$	0	0	3	1	1	1	−1	3	17	27
		$0,g^+$	0	2	1	3	1	3	−1	3	17	25
10 869.9	1.110	$0,g^+$								3	17	<25
10 870.3	1.114	$2,u$	0	3	0	3	1	5	1	3	17	32
10 871.1	1.130	$2,g$								1	17	<25
10 871.3	1.128	$0,g^-$	0	0	1	11	−1	1	1	1	17	66
10 872.0	1.134	$0,u^-$	0	1	0	7	−7	7	7	1	17	35
		$0,u^-$	0	1	0	7	−5	7	5	1	17	32
10 872.7	1.131	$0,g^+$								1	17	<25
10 873.0	1.129	$2,g$								1	17	<25
10 874.6	1.119	$1,u$	1	0	1	5	−1	2	2	2	17	27
10 875.6	1.111	$2,g$	1	2	0	4	0	2	2	3	17	28
10 876.0	1.109	$0,g^-$	0	2	1	3	−3	3	3	3	17	32
10 876.1	1.136	$1,g$	0	1	0	1	1	12	0	1	16	30
		$1,g$	0	1	0	1	−1	12	2	1	16	30
10 876.7	1.128	$2,g$	0	0	1	11	1	1	1	1	17	34
10 877.2	1.120	$1,g$								2	17	<25
10 878.1	1.120	$1,g$								2	17	<25
10 880.1	1.120	$1,u$								2	17	<25
10 880.2	1.149	$0,g^-$	0	0	0	2	−2	14	2	0	16	100
10 880.9	1.130	$2,u$	0	0	1	8	6	4	−4	1	17	41
10 881.4	1.114	$0,u^-$	0	3	0	3	−3	5	3	3	17	63
10 881.8	1.109	$0,g^-$	0	0	3	1	−1	1	1	3	17	26
		$0,g^-$	0	2	1	3	−3	3	3	3	17	38
10 883.2	1.130	$0,u^-$	0	0	1	8	−4	4	4	1	17	35
10 883.6	1.110	$2,g$	0	2	1	3	3	3	−1	3	17	26
10 885.8	1.142	$1,g$	0	0	0	11	3	6	−2	0	17	26
10 885.9	1.107	$0,u^-$	1	0	2	1	−1	1	1	3	17	77
10 887.5	1.107	$2,g$	2	0	1	1	1	1	1	3	17	27
		$2,g$	0	0	3	1	1	1	1	3	17	39
10 888.2	1.124	$1,g$	0	2	0	5	−5	6	6	2	17	40
10 888.3	1.106	$2,u$	1	0	2	1	1	1	1	3	17	73
10 888.4	1.120	$1,u$								2	17	<25
10 890.0	1.142	$1,u$	0	0	0	12	2	5	−1	0	17	29
10 891.7	1.130	$2,u$	1	0	0	9	5	3	−3	1	17	33
10 892.4	1.129	$0,u^+$	1	0	0	9	1	3	−1	1	17	37
10 892.7	1.147	$0,g^+$	0	0	0	4	2	12	−2	0	16	49

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,g^+$	0	0	0	4	0	12	0	0	16	42
10 893.6	1.118	1,*g*	0	0	2	5	1	2	0	2	17	38
		1,*g*	0	0	2	5	−1	2	2	2	17	25
10 893.8	1.149	2,*g*	0	0	0	2	2	14	0	0	16	49
		2,*g*	0	0	0	2	−2	14	4	0	16	51
10 893.9	1.143	1,*u*								0	17	<25
10 894.7	1.134	2,*u*								1	17	<25
10 895.4	1.122	1,*u*	0	2	0	6	−2	5	3	2	17	26
10 896.2	1.134	$0,u^+$	0	1	0	7	7	7	−7	1	17	61
10 899.2	1.114	2,*u*	0	3	0	3	−3	5	5	3	17	45
10 900.6	1.110	$0,u^+$	1	2	0	3	1	3	−1	3	17	33
10 901.5	1.118	1,*u*								2	17	<25
10 902.5	1.132	$0,u^-$	0	1	0	9	−5	5	5	1	17	40
		$0,u^-$	0	1	0	9	−3	5	3	1	17	27
10 902.6	1.111	$0,g^+$	0	2	1	3	3	3	−3	3	17	41
		$0,g^+$	0	2	1	3	1	3	−1	3	17	39
10 904.5	1.147	2,*g*	0	0	0	4	2	12	0	0	16	26
		2,*g*	0	0	0	4	0	12	2	0	16	42
10 904.6	1.132	$0,g^-$	0	1	0	10	−4	4	4	1	17	26
		$0,g^-$	0	1	0	10	−2	4	2	1	17	26
10 905.8	1.120	1,*g*								2	17	<25
10 906.3	1.141	1,*g*	0	0	0	13	3	4	−2	0	17	31
		1,*g*	0	0	0	13	1	4	0	0	17	32
10 907.6	1.131	2,*g*	0	0	1	7	7	5	−5	1	17	32
10 908.1	1.132	2,*u*	0	1	0	9	5	5	−3	1	17	27
		2,*u*	0	1	0	9	−3	5	5	1	17	30
10 908.3	1.132	$0,g^-$	0	1	0	10	−2	4	2	1	17	28
10 910.0	1.118	1,*u*								2	17	<25
10 911.3	1.131	2,*g*								1	17	<25
10 911.3	1.120	1,*g*	0	1	1	6	2	3	−1	2	17	27
		1,*g*	0	1	1	6	0	3	1	2	17	45
10 911.4	1.111	2,*g*	0	2	1	3	3	3	−1	3	17	31
		2,*g*	0	2	1	3	−1	3	3	3	17	42
10 913.7	1.132	$0,g^-$								1	17	<25
10 914.4	1.135	1,*g*	1	0	0	1	1	10	0	1	16	27
		1,*g*	1	0	0	1	−1	10	2	1	16	31
10 915.2	1.118	1,*u*	1	0	1	5	1	2	0	2	17	36
10 915.3	1.144	1,*g*								0	17	<25
10 916.1	1.133	2,*g*								1	17	<25
10 916.5	1.102	1,*u*	0	3	1	1	1	2	0	4	17	44
		1,*u*	0	3	1	1	−1	2	2	4	17	48
10 916.6	1.114	$0,u^+$	0	3	0	3	3	5	−3	3	17	49
		$0,u^+$	0	3	0	3	1	5	−1	3	17	26
10 916.7	1.135	$0,g^+$	0	1	0	6	2	8	−2	1	17	33
10 917.3	1.110	2,*u*								3	17	<25
10 919.5	1.120	1,*g*								2	17	<25
10 919.5	1.111	$0,u^-$	1	2	0	3	−3	3	3	3	17	53
10 919.6	1.150	$0,u^+$	0	0	0	1	1	15	−1	0	16	100
10 919.7	1.129	$0,u^-$	1	0	0	11	−1	1	1	1	17	27
		$0,u^-$	0	1	0	11	−1	3	1	1	17	46
10 920.5	1.131	$0,u^+$	1	0	0	7	1	5	−1	1	17	27
10 921.6	1.130	2,*g*	1	0	0	8	6	4	−4	1	17	28
10 922.0	1.131	2,*u*								1	17	<25
10 922.2	1.135	1,*g*	0	0	1	0	0	11	1	1	16	94
10 922.5	1.105	1,*g*	0	4	0	1	1	4	0	4	17	45
		1,*g*	0	4	0	1	−1	4	2	4	17	43
10 923.0	1.128	$0,g^-$	1	0	0	10	−2	2	2	1	17	68
10 923.3	1.129	2,*g*	1	0	0	10	0	2	2	1	17	27
10 924.1	1.120	1,*u*								2	17	<25
10 924.2	1.129	2,*u*	1	0	0	11	1	1	1	1	17	30
10 924.8	1.123	1,*g*								2	17	<25
10 925.7	1.109	$0,g^+$	0	1	2	2	2	2	−2	3	17	41
		$0,g^+$	0	1	2	2	0	2	0	3	17	26
10 926.3	1.119	1,*u*								2	17	<25

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 926.7	1.128	$0,u^-$	1	0	0	11	−1	1	1	1	17	51
10 928.4	1.134	$0,u^-$	0	1	0	7	−7	7	7	1	17	49
10 929.3	1.130	$0,g^+$								1	17	<25
10 929.4	1.114	$2,u$	0	3	0	3	−3	5	5	3	17	34
10 929.6	1.129	$2,u$								1	17	<25
10 929.9	1.129	$0,g^+$	0	0	1	9	3	3	−3	1	17	52
		$0,g^+$	0	0	1	9	1	3	−1	1	17	26
10 930.4	1.130	$2,u$								1	17	<25
10 931.3	1.135	$2,g$								1	17	<25
10 932.5	1.106	$0,u^+$	2	0	1	2	0	0	0	3	17	36
		$0,u^+$	0	0	3	2	0	0	0	3	17	26
10 933.0	1.129	$0,u^+$	0	0	1	10	2	2	−2	1	17	25
		$0,u^+$	0	0	1	10	0	2	0	1	17	30
10 933.4	1.143	$1,u$	0	0	0	10	8	7	−7	0	17	27
10 933.6	1.150	$2,u$	0	0	0	1	1	15	1	0	16	50
		$2,u$	0	0	0	1	−1	15	3	0	16	50
10 933.6	1.148	$0,u^-$	0	0	0	3	−1	13	1	0	16	79
10 933.6	1.129	$0,u^-$	1	0	0	9	−3	3	3	1	17	50
10 934.5	1.124	$1,u$								2	17	<25
10 934.6	1.102	$1,u$	0	3	1	1	1	2	0	4	17	52
		$1,u$	0	3	1	1	−1	2	2	4	17	46
10 934.6	1.140	$1,u$	0	0	0	14	2	3	−1	0	17	39
		$1,u$	0	0	0	14	0	3	1	0	17	31
10 935.2	1.142	$1,g$	0	0	0	11	7	6	−6	0	17	27
10 935.3	1.110	$0,g^-$	0	1	2	2	−2	2	2	3	17	57
		$0,g^-$	0	2	1	3	−1	3	1	3	17	27
10 935.5	1.134	$2,u$								1	17	<25
10 937.1	1.106	$2,u$	2	0	1	2	2	0	0	3	17	43
		$2,u$	0	0	3	2	2	0	0	3	17	30
10 937.6	1.129	$2,g$	0	0	1	9	−1	3	3	1	17	41
10 937.6	1.120	$1,u$								2	17	<25
10 938.0	1.111	$0,g^-$	0	2	1	3	−1	3	1	3	17	61
10 938.2	1.129	$0,u^+$	0	0	1	8	4	4	−4	1	17	32
10 941.0	1.109	$2,g$	0	1	2	2	2	2	0	3	17	53
10 941.4	1.129	$2,u$	0	0	1	10	2	2	0	1	17	28
		$2,u$	0	0	1	10	0	2	2	1	17	31
10 941.4	1.121	$1,g$								2	17	<25
10 941.9	1.108	$0,u^+$								3	17	<25
10 942.6	1.137	$1,u$	1	0	0	0	0	11	1	1	16	36
		$1,u$	0	1	0	0	0	13	1	1	16	64
10 942.8	1.120	$1,g$	1	0	1	4	4	3	−3	2	17	29
10 944.3	1.144	$1,g$	0	0	0	9	9	8	−8	0	17	35
10 944.5	1.117	$1,u$	2	0	0	6	0	1	1	2	17	38
10 946.0	1.148	$2,u$	0	0	0	3	1	13	1	0	16	40
		$2,u$	0	0	0	3	−1	13	3	0	16	39
10 946.2	1.130	$2,u$								1	17	<25
10 946.5	1.111	$2,g$	0	2	1	3	1	3	1	3	17	50
		$2,g$	0	2	1	3	−1	3	3	3	17	27
10 947.0	1.111	$0,u^+$	1	1	1	2	2	2	−2	3	17	28
		$0,u^+$	1	2	0	3	1	3	−1	3	17	36
10 949.5	1.142	$1,u$	0	0	0	12	6	5	−5	0	17	29
		$1,u$	0	0	0	12	−2	5	3	0	17	26
10 950.2	1.135	$0,g^-$	0	1	0	6	−6	8	6	1	17	34
		$0,g^-$	0	1	0	6	−4	8	4	1	17	35
10 950.8	1.131	$2,g$								1	17	<25
10 950.9	1.110	$2,u$								3	17	<25
10 952.1	1.132	$0,u^-$	1	0	0	7	−5	5	5	1	17	27
10 952.5	1.109	$0,g^+$	0	1	2	2	2	2	−2	3	17	28
		$0,g^+$	0	1	2	2	0	2	0	3	17	47
10 952.7	1.120	$1,u$	0	0	2	4	−2	3	3	2	17	26
10 952.8	1.104	$1,g$	0	4	0	1	1	4	0	4	17	37
		$1,g$	0	4	0	1	−1	4	2	4	17	46
10 953.5	1.131	$0,g^+$	0	0	1	7	5	5	−5	1	17	34
10 953.7	1.131	$2,u$	1	0	0	7	7	5	−5	1	17	37

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 954.5	1.108	2,u								3	17	<25
10 955.5	1.122	1,u	0	2	0	6	0	5	1	2	17	27
10 955.6	1.145	1,u								0	17	<25
10 956.2	1.109	0,u^-	1	1	1	2	−2	2	2	3	17	53
		0,u^-	1	2	0	3	−3	3	3	3	17	28
10 957.5	1.120	1,g								2	17	<25
10 957.8	1.130	0,g^-	1	0	0	8	−4	4	4	1	17	33
		0,g^-	0	0	1	7	−5	5	5	1	17	27
10 961.6	1.113	0,u^-	1	2	0	3	−1	3	1	3	17	30
		0,u^-	0	3	0	3	−1	5	1	3	17	47
10 962.4	1.109	2,g	0	1	2	2	0	2	2	3	17	53
10 962.5	1.101	1,g	1	3	0	1	1	2	0	4	17	36
		1,g	1	3	0	1	−1	2	2	4	17	39
10 964.1	1.131	2,g								1	17	<25
10 967.2	1.107	0,u^+	2	1	0	3	1	1	−1	3	17	55
10 967.7	1.133	0,g^+	0	1	0	8	4	6	−4	1	17	47
10 969.5	1.132	0,u^+	0	1	0	9	3	5	−3	1	17	33
10 970.1	1.135	2,g								1	17	<25
10 970.1	1.124	1,u	0	2	0	4	−4	7	5	2	17	25
10 970.2	1.109	2,u	2	1	0	3	3	1	−1	3	17	33
10 971.4	1.121	1,g								2	17	<25
10 971.4	1.121	1,u								2	17	<25
10 971.9	1.120	1,g								2	17	<25
10 972.9	1.133	0,u^+								1	17	<25
10 973.0	1.112	2,u								3	17	<25
10 974.4	1.149	0,g^+	0	0	0	2	2	14	−2	0	16	47
		0,g^+	0	0	0	2	0	14	0	0	16	53
10 974.7	1.102	0,g^+	0	4	0	6	0	0	0	4	18	97
10 974.8	1.139	1,g	0	0	0	15	3	2	−2	0	17	32
		1,g	0	0	0	15	1	2	0	0	17	47
10 975.5	1.121	1,u								2	17	<25
10 975.5	1.133	2,g								1	17	<25
10 976.1	1.141	1,g	0	0	0	13	5	4	−4	0	17	35
		1,g	0	0	0	13	−1	4	2	0	17	27
10 976.5	1.119	1,g								2	17	<25
10 976.7	1.132	2,u								1	17	<25
10 977.3	1.109	0,u^+	1	1	1	2	2	2	−2	3	17	28
		0,u^+	1	1	1	2	0	2	0	3	17	44
10 978.5	1.144	1,g	0	0	0	9	9	8	−8	0	17	28
10 978.7	1.102	2,g	0	4	0	6	2	0	0	4	18	98
10 978.7	1.143	1,u	0	0	0	10	8	7	−7	0	17	30
10 979.0	1.132	0,u^+								1	17	<25
10 980.1	1.109	0,u^-	2	1	0	3	−1	1	1	3	17	51
10 980.3	1.109	2,u	2	1	0	3	1	1	1	3	17	27
		2,u	1	1	1	2	2	2	0	3	17	28
10 980.6	1.133	2,u								1	17	<25
10 982.1	1.121	1,g								2	17	<25
10 982.3	1.100	1,g	2	2	0	1	1	0	0	4	17	25
		1,g	1	3	0	1	−1	2	2	4	17	42
10 982.9	1.132	0,g^+	1	0	0	6	2	6	−2	1	17	27
10 983.1	1.130	0,g^+								1	17	<25
10 984.2	1.099	1,u	0	2	2	0	0	1	1	4	17	82
10 985.3	1.136	1,u	1	0	0	0	0	11	1	1	16	64
		1,u	0	1	0	0	0	13	1	1	16	36
10 985.5	1.132	2,u	0	0	1	6	6	6	−4	1	17	30
10 986.5	1.131	0,u^+								1	17	<25
10 987.2	1.149	2,g	0	0	0	2	0	14	2	0	16	53
10 987.4	1.119	1,u	0	0	2	4	0	3	1	2	17	38
10 987.6	1.135	0,g^+	0	1	0	6	6	8	−6	1	17	51
10 988.2	1.129	2,g	1	0	0	10	2	2	0	1	17	25
10 988.3	1.115	0,g^+	0	3	0	2	2	6	−2	3	17	41
		0,g^+	0	3	0	2	0	6	0	3	17	33
10 988.4	1.130	0,u^+	1	0	0	9	3	3	−3	1	17	35
10 988.9	1.122	1,g								2	17	<25

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
10 989.3	1.145	1,*u*								0	17	<25
10 989.6	1.130	2,*u*	1	0	0	9	−1	3	3	1	17	30
10 990.9	1.110	2,*u*								3	17	<25
10 991.1	1.099	1,*g*	2	2	0	1	1	0	0	4	17	49
		1,*g*	1	3	0	1	1	2	0	4	17	30
10 991.5	1.142	1,*g*	0	0	0	11	7	6	−6	0	17	31
		1,*g*	0	0	0	11	−5	6	6	0	17	25
10 992.5	1.111	0,u^-	1	2	0	3	−1	3	1	3	17	43
10 992.8	1.130	0,g^+								1	17	<25
10 994.4	1.111	0,u^+	0	2	1	2	2	4	−2	3	17	37
10 994.9	1.132	0,u^-	0	0	1	6	−6	6	6	1	17	42
10 995.1	1.132	2,*g*								1	17	<25
10 996.7	1.132	2,*u*								1	17	<25
10 996.7	1.130	2,*g*								1	17	<25
10 996.9	1.130	0,u^-	0	0	1	8	−4	4	4	1	17	30
		0,u^-	0	0	1	8	−2	4	2	1	17	57
10 998.1	1.130	0,g^+	1	0	0	8	4	4	−4	1	17	43
10 998.3	1.131	2,*g*	1	0	0	8	−2	4	4	1	17	29
10 999.5	1.119	1,*g*								2	17	<25
11 000.0	1.130	0,g^-	0	0	1	9	−1	3	1	1	17	64
11 000.2	1.136	0,u^+	0	1	0	5	3	9	−3	1	17	27
		0,u^+	0	1	0	5	1	9	−1	1	17	41
11 000.8	1.111	2,*u*								3	17	<25
11 001.2	1.108	0,u^+	2	0	1	0	0	2	0	3	17	31
		0,u^+	0	0	3	0	0	2	0	3	17	46
11 002.6	1.111	1,*g*	0	3	0	9	1	0	0	3	18	93
11 003.6	1.107	0,g^+	1	0	2	0	0	2	0	3	17	70
11 004.3	1.121	1,*u*								2	17	<25
11 004.8	1.115	2,*g*	0	3	0	2	0	6	2	3	17	34
11 005.0	1.121	1,*u*	0	1	1	5	1	4	0	2	17	28
		1,*u*	0	1	1	5	−1	4	2	2	17	26
11 005.2	1.135	2,*g*	0	1	0	6	−6	8	8	1	17	39
11 005.3	1.131	0,g^-	0	0	1	7	−5	5	5	1	17	26
11 005.5	1.120	1,*g*								2	17	<25
11 006.3	1.130	2,*u*	0	0	1	8	−2	4	4	1	17	35
11 008.0	1.146	1,*g*								0	17	<25
11 008.5	1.132	0,g^-	1	0	0	6	−6	6	6	1	17	39
		0,g^-	1	0	0	6	−4	6	4	1	17	28
11 009.1	1.129	2,*g*	0	0	1	9	1	3	1	1	17	37
11 010.3	1.110	2,*u*								3	17	<25
11 010.6	1.119	1,*g*	1	0	1	4	0	3	1	2	17	35
11 011.2	1.124	1,*u*								2	17	<25
11 011.5	1.099	1,*g*	1	2	1	0	0	1	1	4	17	86
11 014.9	1.140	1,*u*	0	0	0	14	4	3	−3	0	17	42
		1,*u*	0	0	0	14	−2	3	3	0	17	36
11 015.0	1.150	0,u^-	0	0	0	1	−1	15	1	0	16	100
11 015.2	1.109	2,*u*	2	0	1	0	0	2	2	3	17	27
		2,*u*	0	0	3	0	0	2	2	3	17	40
11 015.8	1.131	2,*g*	0	0	1	7	−3	5	5	1	17	32
11 015.9	1.136	2,*u*								1	17	<25
11 016.8	1.121	1,*g*								2	17	<25
11 016.8	1.142	1,*u*	0	0	0	12	6	5	−5	0	17	33
		1,*u*	0	0	0	12	−4	5	5	0	17	32
11 017.7	1.121	1,*u*								2	17	<25
11 018.2	1.107	2,*g*	1	0	2	0	0	2	2	3	17	74
11 019.9	1.112	0,u^-	0	2	1	2	−2	4	2	3	17	82
11 020.1	1.144	1,*g*	0	0	0	9	−7	8	8	0	17	31
11 020.8	1.131	0,u^+	1	0	0	7	5	5	−5	1	17	30
		0,u^+	0	0	1	6	6	6	−6	1	17	30
11 021.2	1.145	1,*u*	0	0	0	8	−8	9	9	0	17	34
11 022.1	1.132	0,u^-								1	17	<25
11 022.2	1.132	2,*u*	0	0	1	6	6	6	−4	1	17	28
11 023.4	1.120	1,*g*								2	17	<25
11 026.8	1.138	1,*u*	0	0	0	16	2	1	−1	0	17	55

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		1,u	0	0	0	16	0	1	1	0	17	45
11 026.8	1.115	0,g^-	0	3	0	2	−2	6	2	3	17	71
11 028.3	1.150	2,u	0	0	0	1	1	15	1	0	16	50
		2,u	0	0	0	1	−1	15	3	0	16	50
11 029.1	1.110	0,g^+								3	17	<25
11 029.9	1.121	1,g								2	17	<25
11 031.8	1.132	2,g	1	0	0	6	6	6	−4	1	17	27
11 031.9	1.132	0,g^+	1	0	0	6	6	6	−6	1	17	61
11 032.2	1.143	1,u	0	0	0	10	−6	7	7	0	17	32
11 032.2	1.134	0,g^-	0	1	0	6	−6	8	6	1	17	29
11 032.3	1.134	0,u^-	0	1	0	7	−5	7	5	1	17	29
11 032.7	1.112	2,u	0	2	1	2	2	4	0	3	17	36
		2,u	0	2	1	2	−2	4	4	3	17	45
11 034.0	1.132	2,u								1	17	<25
11 034.7	1.133	0,g^-	0	1	0	8	−2	6	2	1	17	29
11 036.3	1.121	1,u								2	17	<25
11 038.9	1.118	1,g	2	0	0	5	1	2	0	2	17	29
11 041.2	1.114	2,g	0	3	0	2	−2	6	4	3	17	43
11 041.4	1.106	0,g^+	2	0	1	1	1	1	−1	3	17	29
11 041.6	1.133	2,g								1	17	<25
11 041.9	1.121	1,u	1	0	1	3	−3	4	4	2	17	27
11 043.0	1.136	0,u^-	0	1	0	5	−5	9	5	1	17	37
		0,u^-	0	1	0	5	−3	9	3	1	17	35
11 043.1	1.133	2,u								1	17	<25
11 044.9	1.122	1,g								2	17	<25
11 045.9	1.130	0,u^-	1	0	0	9	−1	3	1	1	17	38
		0,u^-	0	1	0	9	−1	5	1	1	17	30
11 046.2	1.111	2,g								3	17	<25
11 046.5	1.135	2,g	0	1	0	6	−6	8	8	1	17	27
11 047.7	1.121	1,g								2	17	<25
11 048.3	1.146	1,g								0	17	<25
11 049.4	1.119	1,u	2	0	0	4	4	3	−3	2	17	26
11 049.8	1.125	1,g								2	17	<25
11 051.1	1.132	0,g^+								1	17	<25
11 051.6	1.108	0,g^-	2	0	1	1	−1	1	1	3	17	32
11 052.0	1.130	2,u	1	0	0	9	1	3	1	1	17	27
11 052.9	1.106	2,g	3	0	0	2	2	0	0	3	17	43
11 053.2	1.131	0,g^-	1	0	0	8	−2	4	2	1	17	42
11 053.6	1.110	0,u^+	0	1	2	1	1	3	−1	3	17	58
		0,u^+	0	2	1	2	0	4	0	3	17	28
11 054.5	1.141	1,g	0	0	0	13	5	4	−4	0	17	34
		1,g	0	0	0	13	−3	4	4	0	17	38
11 055.4	1.151	0,g^+	0	0	0	0	0	16	0	0	16	100
11 055.7	1.112	0,u^+	0	2	1	2	2	4	−2	3	17	46
		0,u^+	0	2	1	2	0	4	0	3	17	34
11 056.6	1.131	2,g								1	17	<25
11 056.8	1.142	1,g	0	0	0	11	−5	6	6	0	17	33
11 057.6	1.094	1,g	0	5	0	3	1	0	0	5	18	100
11 058.8	1.145	1,u	0	0	0	8	−8	9	9	0	17	34
11 059.0	1.131	0,u^-	1	0	0	9	−1	3	1	1	17	30
		0,u^-	0	1	0	9	−1	5	1	1	17	37
11 059.3	1.112	1,u	0	3	0	8	2	1	−1	3	18	54
		1,u	0	3	0	8	0	1	1	3	18	38
11 059.9	1.136	2,u								1	17	<25
11 059.9	1.133	0,g^-	1	0	0	6	−6	6	6	1	17	34
11 060.2	1.123	1,u								2	17	<25
11 061.9	1.131	0,u^-	1	0	0	7	−3	5	3	1	17	26
11 061.9	1.133	0,u^+	1	0	0	5	1	7	−1	1	17	35
11 062.4	1.133	2,g								1	17	<25
11 063.3	1.121	1,u								2	17	<25
11 063.6	1.131	2,u								1	17	<25
11 063.6	1.131	0,g^+	0	0	1	7	3	5	−3	1	17	57
11 064.6	1.110	0,g^-	1	2	0	2	−2	4	2	3	17	35
11 064.7	1.122	1,g								2	17	<25

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 065.7	1.139	1,*g*	0	0	0	15	3	2	−2	0	17	49
		1,*g*	0	0	0	15	−1	2	2	0	17	50
11 065.7	1.106	$0,g^+$	3	0	0	2	0	0	0	3	17	45
11 066.0	1.112	2,*u*	0	2	1	2	2	4	0	3	17	27
		2,*u*	0	2	1	2	0	4	2	3	17	56
11 066.2	1.130	$0,u^+$	0	0	1	8	2	4	−2	1	17	44
		$0,u^+$	0	0	1	8	0	4	0	1	17	40
11 066.3	1.131	2,*u*	1	0	0	7	−3	5	5	1	17	32
11 069.1	1.151	2,*g*	0	0	0	0	0	16	2	0	16	100
11 069.1	1.110	2,*u*	0	1	2	1	1	3	1	3	17	46
11 070.7	1.108	$0,g^+$								3	17	<25
11 071.3	1.120	1,*u*								2	17	<25
11 071.4	1.144	1,*g*	0	0	0	9	−7	8	8	0	17	29
11 072.3	1.110	$0,u^-$	0	1	2	1	−1	3	1	3	17	77
11 072.4	1.147	1,*u*								0	17	<25
11 072.6	1.132	$0,u^+$	0	0	1	6	4	6	−4	1	17	44
11 072.8	1.132	2,*g*								1	17	<25
11 073.5	1.113	$0,g^+$	0	3	0	2	2	6	−2	3	17	27
		$0,g^+$	0	3	0	2	0	6	0	3	17	29
11 073.6	1.109	2,*g*	1	2	0	2	−2	4	4	3	17	28
11 074.2	1.103	$0,u^+$	0	4	0	5	1	1	−1	4	18	97
11 074.3	1.131	2,*g*								1	17	<25
11 076.2	1.130	2,*u*	0	0	1	8	2	4	0	1	17	26
		2,*u*	0	0	1	8	0	4	2	1	17	34
11 076.9	1.103	2,*u*	0	4	0	5	3	1	−1	4	18	72
		2,*u*	0	4	0	5	1	1	1	4	18	25
11 077.2	1.133	2,*u*								1	17	<25
11 077.5	1.120	1,*u*								2	17	<25
11 077.8	1.103	1,*g*	0	3	1	0	0	3	1	4	17	97
11 078.2	1.108	2,*g*								3	17	<25
11 081.0	1.120	1,*g*	0	0	2	3	1	4	0	2	17	32
		1,*g*	0	0	2	3	−1	4	2	2	17	29
11 081.1	1.132	$0,g^-$	0	0	1	5	−5	7	5	1	17	27
11 082.0	1.121	1,*u*								2	17	<25
11 083.7	1.109	$0,g^+$	2	1	0	2	2	2	−2	3	17	33
		$0,g^+$	1	1	1	1	1	3	−1	3	17	44
11 084.7	1.109	2,*g*								3	17	<25
11 084.8	1.132	2,*u*	0	0	1	6	−4	6	6	1	17	30
11 085.8	1.110	2,*u*	0	1	2	1	1	3	1	3	17	29
		2,*u*	0	1	2	1	−1	3	3	3	17	44
11 086.2	1.114	2,*g*	0	3	0	2	0	6	2	3	17	30
11 086.9	1.122	1,*g*								2	17	<25
11 087.3	1.134	$0,g^+$								1	17	<25
11 087.3	1.109	$0,g^-$	2	1	0	2	−2	2	2	3	17	56
		$0,g^-$	1	2	0	2	−2	4	2	3	17	25
11 089.7	1.105	1,*u*	0	4	0	0	0	5	1	4	17	80
11 090.7	1.137	1,*g*	0	0	0	17	1	0	0	0	17	100
11 091.6	1.135	$0,u^+$	0	1	0	5	5	9	−5	1	17	51
11 091.8	1.146	1,*g*	0	0	0	7	7	10	−6	0	17	26
		1,*g*	0	0	0	7	−7	10	8	0	17	31
11 092.9	1.121	1,*u*								2	17	<25
11 093.6	1.142	1,*u*	0	0	0	12	−4	5	5	0	17	32
11 094.3	1.133	2,*g*								1	17	<25
11 094.8	1.125	1,*g*	0	2	0	3	3	8	−2	2	17	25
		1,*g*	0	2	0	3	−3	8	4	2	17	25
11 095.8	1.143	1,*u*	0	0	0	10	−6	7	7	0	17	26
11 095.9	1.136	$0,g^+$	0	1	0	4	2	10	−2	1	17	32
11 096.1	1.133	$0,u^-$	1	0	0	5	−5	7	5	1	17	40
		$0,u^-$	1	0	0	5	−3	7	3	1	17	31
11 096.4	1.133	$0,u^+$	0	1	0	7	3	7	−3	1	17	40
11 097.6	1.110	$0,g^+$	2	1	0	2	0	2	0	3	17	37
11 097.7	1.122	1,*g*	0	1	1	4	0	5	1	2	17	45
11 098.0	1.134	$0,g^+$	0	0	1	5	5	7	−5	1	17	38
11 099.4	1.109	$0,g^-$	1	1	1	1	−1	3	1	3	17	80

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 099.9	1.134	2,g								1	17	<25
11 101.3	1.109	2,g	2	1	0	2	2	2	0	3	17	39
11 104.3	1.140	1,u	0	0	0	14	4	3	−3	0	17	30
		1,u	0	0	0	14	−2	3	3	0	17	40
11 105.0	1.109	2,g	2	1	0	2	0	2	2	3	17	36
		2,g	1	1	1	1	1	3	1	3	17	39
11 105.2	1.134	2,u								1	17	<25
11 106.1	1.119	1,u								2	17	<25
11 107.1	1.135	2,u	0	1	0	5	−5	9	7	1	17	27
11 108.5	1.131	0,g^+								1	17	<25
11 108.7	1.145	1,u								0	17	<25
11 109.5	1.121	1,u								2	17	<25
11 111.6	1.135	2,g								1	17	<25
11 112.2	1.103	0,u^-	0	4	0	5	−1	1	1	4	18	98
11 112.7	1.135	2,g								1	17	<25
11 113.1	1.111	2,g	1	1	1	1	−1	3	3	3	17	29
11 113.6	1.121	1,u								2	17	<25
11 114.5	1.133	2,u								1	17	<25
11 115.7	1.131	2,g								1	17	<25
11 115.7	1.111	0,g^+	1	2	0	2	0	4	0	3	17	27
11 116.0	1.112	1,u	0	3	0	8	2	1	−1	3	18	39
		1,u	0	3	0	8	0	1	1	3	18	55
11 117.6	1.103	2,u	0	4	0	5	3	1	−1	4	18	26
		2,u	0	4	0	5	1	1	1	4	18	72
11 118.4	1.132	0,u^+	1	0	0	7	3	5	−3	1	17	39
11 120.0	1.122	1,u								2	17	<25
11 121.4	1.147	1,u								0	17	<25
11 123.8	1.132	2,u								1	17	<25
11 124.7	1.101	1,u	2	2	0	0	0	1	1	4	17	26
		1,u	1	3	0	0	0	3	1	4	17	52
11 124.8	1.132	0,g^+								1	17	<25
11 125.2	1.132	0,g^+								1	17	<25
11 125.4	1.122	1,g								2	17	<25
11 126.6	1.110	2,g								3	17	<25
11 127.4	1.113	1,g	0	3	0	7	3	2	−2	3	18	36
		1,g	0	3	0	7	1	2	0	3	18	40
11 128.2	1.122	1,g								2	17	<25
11 128.2	1.133	0,u^+	1	0	0	5	5	7	−5	1	17	31
		0,u^+	0	0	1	4	2	8	−2	1	17	26
11 128.5	1.138	1,u	0	0	0	16	2	1	−1	0	17	45
		1,u	0	0	0	16	0	1	1	0	17	55
11 129.8	1.132	0,u^-	0	0	1	6	−4	6	4	1	17	36
		0,u^-	0	0	1	6	−2	6	2	1	17	52
11 130.3	1.132	2,g								1	17	<25
11 131.9	1.131	0,g^-	0	0	1	7	−1	5	1	1	17	70
11 132.1	1.142	1,g	0	0	0	11	5	6	−4	0	17	27
11 133.1	1.120	1,u	2	0	0	4	0	3	1	2	17	26
11 133.6	1.132	2,g	1	0	0	6	−4	6	6	1	17	28
11 133.7	1.144	1,g								0	17	<25
11 135.9	1.115	0,u^+	0	3	0	1	1	7	−1	3	17	68
11 136.4	1.113	0,g^+	0	2	1	1	1	5	−1	3	17	83
11 136.5	1.123	1,u								2	17	<25
11 138.4	1.120	0,g^+	0	2	0	12	0	0	0	2	18	84
11 139.3	1.133	0,g^-	0	0	1	5	−5	7	5	1	17	31
		0,g^-	0	0	1	5	−3	7	3	1	17	27
11 139.7	1.133	0,u^+	1	0	0	5	5	7	−5	1	17	26
		0,u^+	1	0	0	5	1	7	−1	1	17	30
11 140.3	1.121	1,u	0	0	2	2	2	5	−1	2	17	29
11 141.8	1.132	2,u	0	0	1	6	−2	6	4	1	17	30
11 142.3	1.120	2,g	0	2	0	12	2	0	0	2	18	84
11 142.6	1.141	1,g	0	0	0	13	3	4	−2	0	17	33
		1,g	0	0	0	13	−3	4	4	0	17	27
11 142.9	1.131	2,g	0	0	1	7	1	5	1	1	17	32
		2,g	0	0	1	7	−1	5	3	1	17	26

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 143.6	1.146	1,*g*	0	0	0	7	7	10	−6	0	17	26
		1,*g*	0	0	0	7	−7	10	8	0	17	31
11 143.9	1.133	2,*u*								1	17	<25
11 144.7	1.099	1,*u*	2	2	0	0	0	1	1	4	17	60
		1,*u*	1	3	0	0	0	3	1	4	17	28
11 146.7	1.124	1,*g*								2	17	<25
11 148.8	1.148	1,*g*	0	0	0	5	1	12	0	0	17	28
		1,*g*	0	0	0	5	−1	12	2	0	17	26
11 148.8	1.136	0,g^-	0	1	0	4	−4	10	4	1	17	45
		0,g^-	0	1	0	4	−2	10	2	1	17	29
11 149.0	1.135	0,u^-	0	1	0	5	−5	9	5	1	17	36
11 150.8	1.113	2,*g*	0	2	1	1	1	5	1	3	17	41
		2,*g*	0	2	1	1	−1	5	3	3	17	42
11 151.4	1.115	2,*u*	0	3	0	1	1	7	1	3	17	36
		2,*u*	0	3	0	1	−1	7	3	3	17	34
11 152.7	1.133	2,*g*								1	17	<25
11 153.5	1.121	0,u^+	0	2	0	11	1	1	−1	2	18	85
11 154.1	1.133	2,*u*								1	17	<25
11 154.2	1.120	1,*g*								2	17	<25
11 154.2	1.134	0,g^+	1	0	0	4	2	8	−2	1	17	34
11 156.7	1.121	2,*u*	0	2	0	11	3	1	−1	2	18	54
		2,*u*	0	2	0	11	1	1	1	2	18	32
11 157.9	1.134	0,g^-	0	1	0	6	−4	8	4	1	17	26
		0,g^-	0	1	0	6	−2	8	2	1	17	34
11 158.1	1.122	1,*u*	1	1	0	4	0	5	1	2	17	25
11 159.5	1.107	0,u^+	3	0	0	1	1	1	−1	3	17	37
11 160.3	1.122	1,*g*	1	1	0	3	−3	6	4	2	17	28
11 162.1	1.135	2,*u*								1	17	<25
11 163.3	1.134	0,u^-	0	0	1	4	−4	8	4	1	17	51
11 164.1	1.136	2,*g*								1	17	<25
11 166.2	1.139	1,*g*	0	0	0	15	1	2	0	0	17	52
		1,*g*	0	0	0	15	−1	2	2	0	17	29
11 168.7	1.134	2,*g*								1	17	<25
11 169.9	1.134	2,*g*								1	17	<25
11 170.1	1.143	1,*u*	0	0	0	10	−4	7	5	0	17	27
11 170.6	1.145	1,*u*	0	0	0	8	−6	9	7	0	17	27
11 170.8	1.132	0,u^-	1	0	0	7	−1	5	1	1	17	38
		0,u^-	0	1	0	7	−1	7	1	1	17	29
11 171.7	1.120	1,*g*	2	0	0	3	−3	4	4	2	17	31
11 172.6	1.113	0,g^-	0	2	1	1	−1	5	1	3	17	96
11 172.9	1.120	1,*g*	1	0	1	2	−2	5	3	2	17	30
11 173.4	1.113	1,*g*	0	3	0	7	3	2	−2	3	18	44
		1,*g*	0	3	0	7	−1	2	2	3	18	47
11 174.4	1.121	1,*u*	0	0	2	2	0	5	1	2	17	39
11 176.5	1.147	1,*u*	0	0	0	6	6	11	−5	0	17	29
		1,*u*	0	0	0	6	−6	11	7	0	17	32
11 176.8	1.110	0,u^+	1	2	0	1	1	5	−1	3	17	29
11 176.9	1.107	2,*u*	3	0	0	1	1	1	1	3	17	30
11 177.1	1.126	1,*u*	0	2	0	2	0	9	1	2	17	28
11 178.9	1.134	2,*u*	0	0	1	4	−4	8	6	1	17	30
11 179.3	1.132	2,*u*								1	17	<25
11 180.0	1.122	0,g^+	0	2	0	10	2	2	−2	2	18	46
		0,g^+	0	2	0	10	0	2	0	2	18	40
11 180.6	1.142	1,*u*	0	0	0	12	4	5	−3	0	17	28
		1,*u*	0	0	0	12	−2	5	3	0	17	31
11 182.2	1.122	2,*g*	0	2	0	10	4	2	−2	2	18	38
		2,*g*	0	2	0	10	2	2	0	2	18	37
11 183.4	1.109	0,u^-	3	0	0	1	−1	1	1	3	17	43
		0,u^-	0	3	0	1	−1	7	1	3	17	26
11 183.5	1.133	0,g^-	1	0	0	6	−2	6	2	1	17	36
11 184.3	1.110	1,*u*	0	2	1	7	1	0	0	3	18	90
11 184.9	1.113	2,*g*	0	2	1	1	1	5	1	3	17	52
		2,*g*	0	2	1	1	−1	5	3	3	17	41
11 185.7	1.104	0,g^+	0	4	0	4	2	2	−2	4	18	55

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,g^+$	0	4	0	4	0	2	0	4	18	41
11 186.4	1.104	$2,g$	0	4	0	4	4	2	−2	4	18	67
11 186.5	1.110	$0,u^-$	3	0	0	1	−1	1	1	3	17	42
		$0,u^-$	0	3	0	1	−1	7	1	3	17	37
11 187.9	1.123	$1,g$	0	1	1	2	0	7	1	2	17	28
11 188.0	1.133	$0,u^-$	1	0	0	5	−3	7	3	1	17	30
11 190.0	1.123	$1,u$	0	1	1	3	1	6	0	2	17	39
		$1,u$	0	1	1	3	−1	6	2	2	17	40
11 190.7	1.133	$2,g$								1	17	<25
11 190.8	1.133	$0,u^-$	1	0	0	7	−1	5	1	1	17	29
		$0,u^-$	0	1	0	7	−1	7	1	1	17	37
11 191.3	1.111	$0,g^+$	0	1	2	0	0	4	0	3	17	78
11 191.4	1.106	$0,u^+$	3	0	0	1	1	1	−1	3	17	28
		$0,u^+$	2	0	1	0	0	2	0	3	17	36
11 191.9	1.110	$2,u$								3	17	<25
11 195.6	1.133	$0,g^+$	0	0	1	5	3	7	−3	1	17	58
11 196.8	1.133	$2,u$								1	17	<25
11 197.3	1.132	$0,u^+$	0	0	1	6	2	6	−2	1	17	47
		$0,u^+$	0	0	1	6	0	6	0	1	17	41
11 198.3	1.134	$0,g^-$	1	0	0	4	−4	8	4	1	17	46
		$0,g^-$	1	0	0	4	−2	8	2	1	17	27
11 198.6	1.115	$2,u$	0	3	0	1	1	7	1	3	17	29
		$2,u$	0	3	0	1	−1	7	3	3	17	33
11 199.1	1.133	$2,u$								1	17	<25
11 199.7	1.094	$1,u$	0	5	0	2	2	1	−1	5	18	73
		$1,u$	0	5	0	2	0	1	1	5	18	26
11 201.2	1.121	$1,g$								2	17	<25
11 202.7	1.120	$1,g$	1	0	1	2	0	5	1	2	17	38
11 203.7	1.140	$1,u$	0	0	0	14	2	3	−1	0	17	35
		$1,u$	0	0	0	14	0	3	1	0	17	43
11 204.2	1.137	$0,u^+$	0	1	0	3	1	11	−1	1	17	42
11 205.5	1.111	$2,g$	0	1	2	0	0	4	2	3	17	76
11 205.6	1.134	$0,u^+$	0	0	1	4	4	8	−4	1	17	44
11 206.2	1.146	$1,g$								0	17	<25
11 206.5	1.107	$2,u$	3	0	0	1	1	1	1	3	17	35
		$2,u$	2	0	1	0	0	2	2	3	17	29
11 207.2	1.114	$1,u$	0	3	0	6	4	3	−3	3	18	28
		$1,u$	0	3	0	6	2	3	−1	3	18	34
11 207.4	1.144	$1,g$	0	0	0	9	5	8	−4	0	17	25
		$1,g$	0	0	0	9	−5	8	6	0	17	25
11 207.7	1.148	$1,g$	0	0	0	5	−3	12	4	0	17	25
11 208.5	1.133	$2,g$	0	0	1	5	−3	7	5	1	17	28
11 208.7	1.123	$1,g$								2	17	<25
11 208.7	1.136	$0,g^+$	0	1	0	4	4	10	−4	1	17	51
11 209.3	1.132	$2,u$	0	0	1	6	0	6	2	1	17	33
11 209.5	1.110	$0,u^+$	2	1	0	1	1	3	−1	3	17	43
		$0,u^+$	1	2	0	1	1	5	−1	3	17	34
11 212.2	1.123	$1,u$								2	17	<25
11 212.7	1.104	$0,g^-$	0	4	0	4	−2	2	2	4	18	98
11 213.7	1.134	$2,g$								1	17	<25
11 215.3	1.111	$0,u^-$	2	1	0	1	−1	3	1	3	17	43
		$0,u^-$	0	3	0	1	−1	7	1	3	17	26
11 216.7	1.104	$2,g$	0	4	0	4	4	2	−2	4	18	27
		$2,g$	0	4	0	4	2	2	0	4	18	30
		$2,g$	0	4	0	4	0	2	2	4	18	40
11 217.6	1.123	$0,u^+$	0	2	0	9	3	3	−3	2	18	27
		$0,u^+$	0	2	0	9	1	3	−1	2	18	59
11 218.2	1.142	$1,g$	0	0	0	11	3	6	−2	0	17	28
		$1,g$	0	0	0	11	−3	6	4	0	17	29
11 218.4	1.110	$1,g$	1	2	0	7	1	0	0	3	18	61
11 218.7	1.123	$2,u$	0	2	0	9	5	3	−3	2	18	30
		$2,u$	0	2	0	9	3	3	−1	2	18	34
11 218.8	1.135	$0,u^+$	0	1	0	5	3	9	−3	1	17	39
11 218.8	1.101	$0,u^+$	0	3	1	4	0	0	0	4	18	97

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 219.1	1.135	2,u								1	17	<25
11 220.1	1.136	2,u								1	17	<25
11 220.3	1.095	1,u	0	5	0	2	2	1	−1	5	18	26
		1,u	0	5	0	2	0	1	1	5	18	73
11 221.1	1.110	0,u^+	1	1	1	0	0	4	0	3	17	72
11 222.6	1.110	2,u	2	1	0	1	1	3	1	3	17	30
11 222.8	1.101	2,u	0	3	1	4	2	0	0	4	18	97
11 222.9	1.136	2,g	0	1	0	4	4	10	−2	1	17	25
		2,g	0	1	0	4	−4	10	6	1	17	27
11 226.7	1.121	1,g								2	17	<25
11 227.0	1.121	0,u^-	0	2	0	11	−1	1	1	2	18	87
11 227.4	1.135	0,g^+	0	0	1	3	3	9	−3	1	17	26
		0,g^+	0	0	1	3	1	9	−1	1	17	54
11 227.8	1.111	2,u	2	1	0	1	−1	3	3	3	17	41
11 228.5	1.124	1,g	0	1	1	2	2	7	−1	2	17	31
11 229.6	1.113	1,g	0	3	0	7	1	2	0	3	18	51
11 230.8	1.135	2,u								1	17	<25
11 231.6	1.121	2,u	0	2	0	11	3	1	−1	2	18	33
		2,u	0	2	0	11	1	1	1	2	18	54
11 232.1	1.122	1,g	0	0	2	1	1	6	0	2	17	38
11 232.4	1.125	1,u	0	2	0	2	2	9	−1	2	17	27
		1,u	0	2	0	2	−2	9	3	2	17	28
11 233.0	1.133	0,g^+								1	17	<25
11 234.5	1.110	2,u	1	1	1	0	0	4	2	3	17	65
11 237.4	1.149	1,u	0	0	0	4	2	13	−1	0	17	26
		1,u	0	0	0	4	0	13	1	0	17	33
11 239.1	1.111	0,u^-	2	1	0	1	−1	3	1	3	17	37
		0,u^-	1	2	0	1	−1	5	1	3	17	47
11 240.7	1.147	1,u	0	0	0	6	6	11	−5	0	17	27
		1,u	0	0	0	6	−6	11	7	0	17	30
11 241.1	1.141	1,g	0	0	0	13	1	4	0	0	17	41
		1,g	0	0	0	13	−1	4	2	0	17	31
11 242.6	1.133	2,g								1	17	<25
11 242.7	1.114	1,u	0	3	0	6	4	3	−3	3	18	41
		1,u	0	3	0	6	−2	3	3	3	18	30
11 242.8	1.135	2,g	0	0	1	3	1	9	1	1	17	28
		2,g	0	0	1	3	−1	9	3	1	17	25
11 242.8	1.122	0,g^-	0	2	0	10	−2	2	2	2	18	88
11 244.1	1.145	1,u								0	17	<25
11 246.7	1.122	2,g	0	2	0	10	4	2	−2	2	18	40
		2,g	0	2	0	10	0	2	2	2	18	42
11 247.1	1.085	0,g^+	0	6	0	0	0	0	0	6	18	100
11 247.3	1.104	0,g^+	0	4	0	4	2	2	−2	4	18	41
		0,g^+	0	4	0	4	0	2	0	4	18	47
11 248.4	1.134	0,u^+	1	0	0	5	3	7	−3	1	17	39
11 250.5	1.111	2,u								3	17	<25
11 250.9	1.134	0,g^+	1	0	0	4	4	8	−4	1	17	47
11 251.2	1.123	1,u	1	1	0	2	0	7	1	2	17	26
11 251.7	1.123	1,g								2	17	<25
11 254.4	1.104	2,g	0	4	0	4	2	2	0	4	18	32
		2,g	0	4	0	4	0	2	2	4	18	49
11 255.5	1.143	1,u	0	0	0	10	4	7	−3	0	17	26
		1,u	0	0	0	10	−2	7	3	0	17	25
11 256.4	1.134	0,g^+	0	1	0	6	2	8	−2	1	17	26
11 257.4	1.118	0,u^+	0	1	1	10	0	0	0	2	18	75
11 257.5	1.134	2,u								1	17	<25
11 259.3	1.135	0,u^+	1	0	0	3	1	9	−1	1	17	48
11 261.1	1.110	1,g	0	2	1	6	2	1	−1	3	18	43
11 261.1	1.134	0,u^-	0	0	1	4	−4	8	4	1	17	31
		0,u^-	0	0	1	4	−2	8	2	1	17	58
11 261.2	1.118	2,u	0	1	1	10	2	0	0	2	18	76
11 261.5	1.101	0,g^+	1	3	0	4	0	0	0	4	18	81
11 261.6	1.122	1,u								2	17	<25
11 262.5	1.133	0,g^-	0	0	1	5	−1	7	1	1	17	72

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 263.3	1.134	2,g								1	17	<25
11 263.9	1.134	2,g	1	0	0	4	−4	8	6	1	17	28
11 265.6	1.101	2,g	1	3	0	4	2	0	0	4	18	80
11 266.4	1.124	2,g	0	2	0	8	6	4	−4	2	18	28
		2,g	0	2	0	8	4	4	−2	2	18	30
11 266.7	1.123	0,g^+	0	2	0	8	2	4	−2	2	18	41
		0,g^+	0	2	0	8	0	4	0	2	18	27
11 267.3	1.137	0,u^-	0	1	0	3	−3	11	3	1	17	55
11 267.6	1.122	1,g	0	0	2	1	1	6	0	2	17	36
		1,g	0	0	2	1	−1	6	2	2	17	37
11 269.9	1.120	1,u								2	17	<25
11 270.1	1.123	0,u^-	0	2	0	9	−3	3	3	2	18	71
11 270.5	1.135	0,g^-	0	0	1	3	−3	9	3	1	17	58
11 272.8	1.119	0,g^+	0	1	1	9	1	1	−1	2	18	42
11 273.0	1.123	2,u	0	2	0	9	5	3	−3	2	18	39
		2,u	0	2	0	9	1	3	1	2	18	25
11 274.1	1.148	1,g	0	0	0	5	5	12	−4	0	17	33
		1,g	0	0	0	5	−5	12	6	0	17	35
11 274.2	1.135	2,u								1	17	<25
11 274.7	1.134	2,u	0	0	1	4	−2	8	4	1	17	27
11 275.3	1.133	2,g	0	0	1	5	1	7	1	1	17	30
		2,g	0	0	1	5	−1	7	3	1	17	28
11 276.3	1.119	2,g	0	1	1	9	3	1	−1	2	18	27
11 278.2	1.142	1,u	0	0	0	12	2	5	−1	0	17	30
		1,u	0	0	0	12	0	5	1	0	17	38
11 279.1	1.136	0,g^-	0	1	0	4	−2	10	2	1	17	39
11 280.1	1.146	1,g	0	0	0	7	5	10	−4	0	17	26
		1,g	0	0	0	7	−5	10	6	0	17	26
11 281.4	1.111	1,u								3	18	<25
11 281.7	1.124	1,g	0	1	1	2	0	7	1	2	17	52
11 281.9	1.137	2,u	0	1	0	3	3	11	−1	1	17	28
		2,u	0	1	0	3	−3	11	5	1	17	27
11 284.9	1.135	2,g	0	0	1	3	−3	9	5	1	17	29
11 288.9	1.112	1,u	0	3	0	6	2	3	−1	3	18	26
11 289.5	1.114	0,u^+	0	2	1	0	0	6	0	3	17	95
11 292.1	1.136	2,g								1	17	<25
11 292.4	1.144	1,g	0	0	0	9	3	8	−2	0	17	26
		1,g	0	0	0	9	−3	8	4	0	17	28
11 293.8	1.123	1,u	1	1	0	2	2	7	−1	2	17	27
		1,u	1	1	0	2	−2	7	3	2	17	32
11 295.0	1.134	0,u^-	1	0	0	5	−1	7	1	1	17	37
		0,u^-	0	1	0	5	−1	9	1	1	17	33
11 295.8	1.116	0,g^+	1	2	0	0	0	6	0	3	17	31
		0,g^+	0	3	0	0	0	8	0	3	17	61
11 296.4	1.125	1,u								2	17	<25
11 299.2	1.114	1,g	0	3	0	5	3	4	−2	3	18	25
11 299.4	1.120	1,u	1	0	1	1	1	6	0	2	17	27
		1,u	1	0	1	1	−1	6	2	2	17	26
11 299.8	1.111	1,g	0	2	1	6	2	1	−1	3	18	37
		1,g	0	2	1	6	0	1	1	3	18	49
11 301.0	1.119	0,u^+	1	1	0	9	1	1	−1	2	18	25
11 302.5	1.108	1,g	0	1	2	5	1	0	0	3	18	52
11 303.1	1.114	2,u	0	2	1	0	0	6	2	3	17	95
11 304.2	1.119	2,u								2	18	<25
11 305.6	1.134	2,u								1	17	<25
11 306.5	1.149	1,u	0	0	0	4	4	13	−3	0	17	29
		1,u	0	0	0	4	−4	13	5	0	17	29
11 309.2	1.106	0,g^+	3	0	0	0	0	2	0	3	17	78
11 309.2	1.124	0,g^-	0	2	0	8	−4	4	4	2	18	55
		0,g^-	0	2	0	8	−2	4	2	2	18	33
11 309.6	1.105	0,u^+	0	4	0	3	3	3	−3	4	18	38
		0,u^+	0	4	0	3	1	3	−1	4	18	56
11 310.4	1.116	2,g	1	2	0	0	0	6	2	3	17	30
		2,g	0	3	0	0	0	8	2	3	17	63

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 310.4	1.124	2,g	0	2	0	8	6	4	−4	2	18	38
11 312.9	1.120	0,g^+	0	2	0	10	0	2	0	2	18	32
11 313.2	1.135	0,g^-	1	0	0	4	−2	8	2	1	17	42
11 313.9	1.135	0,u^-	1	0	0	3	−3	9	3	1	17	56
11 315.3	1.142	1,g	0	0	0	11	1	6	0	0	17	36
		1,g	0	0	0	11	−1	6	2	0	17	31
11 315.4	1.147	1,u	0	0	0	6	−4	11	5	0	17	26
11 316.7	1.119	2,g								2	18	<25
11 317.0	1.126	1,g	0	2	0	1	1	10	0	2	17	29
		1,g	0	2	0	1	−1	10	2	2	17	28
11 317.3	1.120	0,g^+								2	18	<25
11 317.9	1.108	1,u	1	1	1	5	1	0	0	3	18	27
11 319.7	1.122	1,u	2	0	0	2	0	5	1	2	17	25
11 320.4	1.124	1,u	0	1	1	1	1	8	0	2	17	30
		1,u	0	1	1	1	−1	8	2	2	17	32
11 321.3	1.121	2,g	0	2	0	10	2	2	0	2	18	30
		2,g	0	2	0	10	0	2	2	2	18	26
11 321.8	1.134	0,u^-	1	0	0	5	−1	7	1	1	17	33
		0,u^-	0	1	0	5	−1	9	1	1	17	37
11 323.5	1.106	2,g	3	0	0	0	0	2	2	3	17	81
11 323.9	1.135	2,g								1	17	<25
11 324.0	1.115	1,g	0	3	0	5	5	4	−4	3	18	41
11 324.7	1.138	0,g^+	0	1	0	2	2	12	−2	1	17	34
		0,g^+	0	1	0	2	0	12	0	1	17	30
11 325.9	1.105	2,u	0	4	0	3	3	3	−1	4	18	48
		2,u	0	4	0	3	1	3	1	4	18	34
11 325.9	1.105	0,u^-	0	4	0	3	−3	3	3	4	18	85
11 326.3	1.124	2,u	0	2	0	7	7	5	−5	2	18	34
		2,u	0	2	0	7	5	5	−3	2	18	26
11 326.3	1.135	0,g^+	0	0	1	3	3	9	−3	1	17	56
		0,g^+	0	0	1	3	1	9	−1	1	17	27
11 327.5	1.134	0,u^+	0	0	1	4	2	8	−2	1	17	47
		0,u^+	0	0	1	4	0	8	0	1	17	43
11 327.7	1.124	0,u^+	0	2	0	7	3	5	−3	2	18	29
		0,u^+	0	2	0	7	1	5	−1	2	18	42
11 327.9	1.135	2,u	1	0	0	3	3	9	−1	1	17	26
		2,u	1	0	0	3	−3	9	5	1	17	31
11 329.0	1.145	1,u								0	17	<25
11 329.7	1.134	2,u								1	17	<25
11 330.8	1.123	0,u^+	0	2	0	9	3	3	−3	2	18	58
		0,u^+	0	2	0	9	1	3	−1	2	18	30
11 332.2	1.111	1,u	1	2	0	6	0	1	1	3	18	31
11 333.2	1.102	0,g^+	0	3	1	3	1	1	−1	4	18	88
11 333.8	1.112	0,g^+	2	1	0	0	0	4	0	3	17	33
		0,g^+	1	2	0	0	0	6	0	3	17	26
		0,g^+	0	3	0	0	0	8	0	3	17	26
11 334.8	1.102	2,g	0	3	1	3	3	1	−1	4	18	76
11 334.8	1.136	0,u^+	0	0	1	2	2	10	−2	1	17	33
		0,u^+	0	0	1	2	0	10	0	1	17	40
11 335.5	1.118	0,g^+	0	0	2	8	0	0	0	2	18	60
		0,g^+	1	1	0	10	0	0	0	2	18	31
11 335.7	1.123	2,u	0	2	0	9	3	3	−1	2	18	32
		2,u	0	2	0	9	−1	3	3	2	18	39
11 337.9	1.150	1,g	0	0	0	3	1	14	0	0	17	36
		1,g	0	0	0	3	−1	14	2	0	17	35
11 338.3	1.118	2,g	0	0	2	8	2	0	0	2	18	60
		2,g	1	1	0	10	2	0	0	2	18	30
11 339.0	1.137	0,u^+	0	1	0	3	3	11	−3	1	17	35
11 339.4	1.137	2,g								1	17	<25
11 340.3	1.120	0,g^+								2	18	<25
11 340.4	1.136	2,g								1	17	<25
11 341.0	1.134	2,u	0	0	1	4	0	8	2	1	17	34
11 342.8	1.111	1,u	0	2	1	5	3	2	−2	3	18	31
11 343.1	1.120	2,g								2	18	<25

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 344.4	1.131	1,u	0	1	0	12	2	3	−1	1	18	30
11 344.9	1.112	1,u	0	3	0	6	0	3	1	3	18	32
11 345.4	1.107	1,g	1	0	2	3	1	0	0	3	18	59
11 346.0	1.123	1,u	1	1	0	2	0	7	1	2	17	31
11 346.6	1.131	1,g								1	18	<25
11 347.3	1.112	2,g	2	1	0	0	0	4	2	3	17	35
		2,g	1	2	0	0	0	6	2	3	17	27
11 347.6	1.118	0,u^+	1	0	1	8	0	0	0	2	18	48
11 347.9	1.119	0,g^-	0	1	1	9	−1	1	1	2	18	80
11 348.0	1.105	0,u^+	0	4	0	3	3	3	−3	4	18	59
		0,u^+	0	4	0	3	1	3	−1	4	18	34
11 349.0	1.118	2,u	1	0	1	8	2	0	0	2	18	42
11 349.2	1.136	2,u	0	0	1	2	0	10	2	1	17	36
11 349.6	1.107	1,u	0	0	3	3	1	0	0	3	18	30
		1,u	1	1	1	5	1	0	0	3	18	34
11 350.1	1.148	1,g	0	0	0	5	5	12	−4	0	17	26
		1,g	0	0	0	5	−5	12	6	0	17	27
11 351.1	1.123	1,g	1	0	1	0	0	7	1	2	17	25
11 352.1	1.143	1,u	0	0	0	10	2	7	−1	0	17	28
		1,u	0	0	0	10	0	7	1	0	17	36
11 352.7	1.136	2,u								1	17	<25
11 353.1	1.119	2,g	0	1	1	9	1	1	1	2	18	54
11 355.0	1.114	1,g	0	3	0	5	−3	4	4	3	18	37
11 355.8	1.132	1,g								1	18	<25
11 355.9	1.105	2,u	0	4	0	3	3	3	−1	4	18	32
		2,u	0	4	0	3	−1	3	3	4	18	50
11 356.8	1.135	0,g^+								1	17	<25
11 358.3	1.102	0,g^-	0	3	1	3	−1	1	1	4	18	98
11 358.6	1.124	2,u	0	2	0	7	7	5	−5	2	18	38
11 358.9	1.124	0,g^+	0	2	0	8	4	4	−4	2	18	62
11 359.6	1.119	0,u^+	1	1	0	9	1	1	−1	2	18	55
11 360.6	1.119	2,u	1	1	0	9	3	1	−1	2	18	29
11 360.6	1.124	0,u^-	0	2	0	7	−5	5	5	2	18	45
		0,u^-	0	2	0	7	−3	5	3	2	18	36
11 360.7	1.123	1,u	0	0	2	0	0	7	1	2	17	75
11 362.2	1.112	0,g^+	2	1	0	0	0	4	0	3	17	43
		0,g^+	1	2	0	0	0	6	0	3	17	42
11 363.0	1.124	2,g	0	2	0	8	−2	4	4	2	18	30
11 363.2	1.092	1,u	0	4	1	1	1	0	0	5	18	99
11 363.4	1.095	1,g	0	5	0	1	1	2	0	5	18	52
		1,g	0	5	0	1	−1	2	2	5	18	46
11 364.5	1.102	2,g	0	3	1	3	1	1	1	4	18	81
11 364.5	1.120	0,u^-	0	1	1	8	−2	2	2	2	18	43
11 365.2	1.146	1,g	0	0	0	7	3	10	−2	0	17	27
		1,g	0	0	0	7	−3	10	4	0	17	29
11 366.8	1.130	1,u	0	1	0	14	2	1	−1	1	18	38
		1,u	0	1	0	14	0	1	1	1	18	31
11 368.3	1.135	2,g								1	17	<25
11 369.7	1.111	1,g								3	18	<25
11 370.1	1.119	2,u								2	18	<25
11 370.7	1.133	1,u								1	18	<25
11 373.0	1.125	1,u	0	1	1	1	1	8	0	2	17	45
		1,u	0	1	1	1	−1	8	2	2	17	49
11 373.7	1.101	0,u^+	1	3	0	3	1	1	−1	4	18	80
11 374.5	1.112	2,g	2	1	0	0	0	4	2	3	17	43
		2,g	1	2	0	0	0	6	2	3	17	42
11 375.7	1.111	1,u	0	2	1	5	3	2	−2	3	18	30
		1,u	0	2	1	5	−1	2	2	3	18	34
11 376.3	1.101	2,u	1	3	0	3	3	1	−1	4	18	66
11 376.7	1.136	0,g^+	1	0	0	2	2	10	−2	1	17	37
		0,g^+	1	0	0	2	0	10	0	1	17	32
11 377.7	1.135	0,u^+	1	0	0	3	3	9	−3	1	17	43
11 379.8	1.118	0,u^+	0	0	2	7	1	1	−1	2	18	49
11 381.0	1.118	2,u	0	0	2	7	3	1	−1	2	18	36

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 381.3	1.095	1,*g*	0	5	0	1	1	2	0	5	18	43
		1,*g*	0	5	0	1	−1	2	2	5	18	54
11 381.4	1.105	0,u^-	0	4	0	3	−1	3	1	4	18	72
11 383.4	1.126	1,*g*	0	2	0	1	−1	10	2	2	17	27
11 384.1	1.149	1,*u*	0	0	0	4	4	13	−3	0	17	36
		1,*u*	0	0	0	4	−4	13	5	0	17	38
11 386.6	1.124	1,*g*	1	1	0	1	1	8	0	2	17	27
		1,*g*	1	1	0	1	−1	8	2	2	17	30
11 387.2	1.135	0,g^+								1	17	<25
11 388.1	1.119	0,g^+	1	0	1	7	1	1	−1	2	18	52
11 388.4	1.119	2,*g*	1	0	1	7	3	1	−1	2	18	26
11 388.8	1.144	1,*g*	0	0	0	9	1	8	0	0	17	34
		1,*g*	0	0	0	9	−1	8	2	0	17	31
11 389.9	1.135	2,*u*								1	17	<25
11 390.7	1.136	0,u^-	0	0	1	2	−2	10	2	1	17	92
11 390.9	1.105	2,*u*	0	4	0	3	1	3	1	4	18	41
		2,*u*	0	4	0	3	−1	3	3	4	18	35
11 391.2	1.136	2,*g*	1	0	0	2	0	10	2	1	17	32
11 391.9	1.121	0,u^+								2	18	<25
11 392.3	1.135	0,g^-	0	0	1	3	−1	9	1	1	17	78
11 393.2	1.129	1,*g*	0	1	0	15	1	0	0	1	18	72
11 393.6	1.114	1,*g*	0	3	0	5	−3	4	4	3	18	26
11 393.9	1.120	0,g^-	1	1	0	8	−2	2	2	2	18	28
11 394.9	1.121	2,*u*								2	18	<25
11 396.1	1.135	2,*g*								1	17	<25
11 396.6	1.121	1,*g*	2	0	0	1	−1	6	2	2	17	25
		1,*g*	1	0	1	0	0	7	1	2	17	44
11 397.6	1.109	1,*u*	0	1	2	4	2	1	−1	3	18	41
11 397.9	1.120	2,*g*								2	18	<25
11 398.1	1.138	0,g^-	1	0	0	2	−2	10	2	1	17	30
		0,g^-	0	1	0	2	−2	12	2	1	17	65
11 398.9	1.122	0,u^-	0	2	0	9	−1	3	1	2	18	50
11 399.4	1.134	1,*g*								1	18	<25
11 399.8	1.124	0,u^+	0	2	0	7	5	5	−5	2	18	45
		0,u^+	0	2	0	7	1	5	−1	2	18	30
11 400.0	1.099	0,g^+	0	2	2	2	0	0	0	4	18	79
11 401.1	1.147	1,*u*								0	17	<25
11 401.5	1.125	0,g^+	0	2	0	6	2	6	−2	2	18	32
11 401.9	1.124	2,*u*								2	18	<25
11 403.9	1.120	2,*g*	1	1	0	8	4	2	−2	2	18	39
11 403.9	1.102	0,u^-	1	3	0	3	−1	1	1	4	18	80
11 404.0	1.099	2,*g*	0	2	2	2	2	0	0	4	18	80
11 404.3	1.121	2,*u*	0	2	0	9	1	3	1	2	18	25
11 404.3	1.120	0,g^+	1	1	0	8	2	2	−2	2	18	26
11 404.9	1.136	2,*u*	0	0	1	2	2	10	0	1	17	41
		2,*u*	0	0	1	2	−2	10	4	1	17	47
11 406.3	1.135	2,*g*	0	0	1	3	1	9	1	1	17	31
		2,*g*	0	0	1	3	−1	9	3	1	17	31
11 407.2	1.120	0,u^-								2	18	<25
11 407.6	1.112	1,*g*								3	18	<25
11 409.1	1.091	1,*g*	1	4	0	1	1	0	0	5	18	95
11 409.4	1.102	2,*u*	1	3	0	3	1	1	1	4	18	61
11 410.3	1.132	1,*g*	0	1	0	11	5	4	−4	1	18	29
11 411.4	1.115	1,*u*	0	3	0	4	2	5	−1	3	18	26
11 411.6	1.121	2,*u*								2	18	<25
11 412.0	1.138	2,*g*	0	1	0	2	2	12	0	1	17	32
		2,*g*	0	1	0	2	−2	12	4	1	17	33
11 412.4	1.123	1,*g*	2	0	0	1	1	6	0	2	17	28
		1,*g*	2	0	0	1	−1	6	2	2	17	26
11 412.4	1.125	2,*g*								2	18	<25
11 412.5	1.109	1,*g*	1	1	1	4	2	1	−1	3	18	32
11 412.7	1.132	1,*u*	0	1	0	12	4	3	−3	1	18	26
11 414.6	1.112	1,*u*	0	2	1	5	1	2	0	3	18	50
		1,*u*	0	2	1	5	−1	2	2	3	18	28

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 417.6	1.150	1,g	0	0	0	3	3	14	−2	0	17	39
		1,g	0	0	0	3	−3	14	4	0	17	40
11 417.8	1.124	0,g^-	0	2	0	8	−4	4	4	2	18	28
		0,g^-	0	2	0	8	−2	4	2	2	18	59
11 418.4	1.136	0,u^-	1	0	0	3	−1	9	1	1	17	37
		0,u^-	0	1	0	3	−1	11	1	1	17	43
11 421.1	1.109	1,u	0	1	2	4	0	1	1	3	18	41
11 421.2	1.133	1,u								1	18	<25
11 422.4	1.099	0,u^+	1	2	1	2	0	0	0	4	18	86
11 422.6	1.118	0,u^-	0	0	2	7	−1	1	1	2	18	62
		0,u^-	1	1	0	9	−1	1	1	2	18	28
11 423.9	1.124	2,g	0	2	0	8	4	4	−2	2	18	28
		2,g	0	2	0	8	−2	4	4	2	18	28
11 425.4	1.145	1,u	0	0	0	8	2	9	−1	0	17	26
		1,u	0	0	0	8	0	9	1	0	17	36
11 426.0	1.125	0,g^-	0	2	0	6	−6	6	6	2	18	43
		0,g^-	0	2	0	6	−4	6	4	2	18	33
11 426.5	1.099	2,u	1	2	1	2	2	0	0	4	18	89
11 427.1	1.118	2,u	0	0	2	7	1	1	1	2	18	45
11 430.5	1.131	1,g	0	1	0	13	3	2	−2	1	18	38
		1,g	0	1	0	13	−1	2	2	1	18	39
11 430.7	1.136	2,u								1	17	<25
11 432.0	1.110	1,g								3	18	<25
11 433.2	1.119	2,g	0	0	2	6	4	2	−2	2	18	30
11 433.9	1.121	0,u^-								2	18	<25
11 434.5	1.119	0,g^+	0	0	2	6	2	2	−2	2	18	27
11 436.5	1.148	1,g	0	0	0	5	3	12	−2	0	17	31
		1,g	0	0	0	5	−3	12	4	0	17	31
11 436.5	1.119	0,g^-	1	0	1	7	−1	1	1	2	18	51
		0,g^-	0	1	1	7	−3	3	3	2	18	27
11 436.9	1.113	1,u								3	18	<25
11 437.0	1.121	2,u								2	18	<25
11 437.7	1.120	0,u^+	0	1	1	8	2	2	−2	2	18	39
		0,u^+	0	1	1	8	0	2	0	2	18	43
11 438.4	1.109	1,g								3	18	<25
11 438.4	1.110	1,u	1	0	2	2	2	1	−1	3	18	32
11 438.7	1.119	2,g								2	18	<25
11 439.0	1.134	1,g	0	1	0	9	7	6	−6	1	18	27
11 440.8	1.124	1,g	1	1	0	1	1	8	0	2	17	26
		1,g	1	1	0	1	−1	8	2	2	17	28
11 441.0	1.134	1,u								1	18	<25
11 441.4	1.110	1,g								3	18	<25
11 441.8	1.120	0,u^+	1	0	1	6	2	2	−2	2	18	26
11 442.2	1.136	0,g^-	1	0	0	2	−2	10	2	1	17	65
		0,g^-	0	1	0	2	−2	12	2	1	17	34
11 442.9	1.131	1,u	0	0	1	11	1	2	0	1	18	27
11 443.3	1.112	1,g								3	18	<25
11 443.5	1.120	2,u	1	0	1	6	4	2	−2	2	18	26
11 443.7	1.130	1,g								1	18	<25
11 444.5	1.120	2,u	0	1	1	8	2	2	0	2	18	37
		2,u	0	1	1	8	0	2	2	2	18	32
11 447.2	1.120	0,g^-	1	1	0	8	−2	2	2	2	18	55
11 447.3	1.124	0,u^-	0	2	0	7	−5	5	5	2	18	27
		0,u^-	0	2	0	7	−3	5	3	2	18	33
11 449.1	1.125	0,g^+	0	2	0	6	6	6	−6	2	18	61
11 449.5	1.124	2,g								2	18	<25
11 449.9	1.120	2,g								2	18	<25
11 450.5	1.151	1,u	0	0	0	2	2	15	−1	0	17	27
		1,u	0	0	0	2	0	15	1	0	17	47
		1,u	0	0	0	2	−2	15	3	0	17	26
11 452.1	1.124	2,u								2	18	<25
11 452.4	1.136	0,u^-	1	0	0	3	−1	9	1	1	17	43
		0,u^-	0	1	0	3	−1	11	1	1	17	37
11 453.0	1.106	0,g^+	0	4	0	2	2	4	−2	4	18	51

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,g^+$	0	4	0	2	0	4	0	4	18	38
11 453.3	1.109	$1,g$	2	1	0	5	1	0	0	3	18	40
11 454.8	1.136	$0,g^+$	0	0	1	1	1	11	−1	1	17	91
11 455.4	1.136	$2,g$	1	0	0	2	2	10	0	1	17	29
		$2,g$	1	0	0	2	−2	10	4	1	17	36
11 455.6	1.120	$0,g^+$	0	1	1	7	3	3	−3	2	18	30
11 455.7	1.129	$1,g$	0	0	1	12	2	1	−1	1	18	38
		$1,g$	0	0	1	12	0	1	1	1	18	30
11 455.9	1.122	$2,u$								2	18	<25
11 456.0	1.130	$1,u$	0	1	0	14	2	1	−1	1	18	34
		$1,u$	0	1	0	14	0	1	1	1	18	41
11 456.8	1.136	$0,u^+$	0	0	1	2	2	10	−2	1	17	33
		$0,u^+$	0	0	1	2	0	10	0	1	17	39
11 457.6	1.138	$0,u^+$	0	1	0	1	1	13	−1	1	17	51
11 458.8	1.112	$1,g$								3	18	<25
11 459.6	1.103	$0,u^+$	0	3	1	2	2	2	−2	4	18	56
		$0,u^+$	0	3	1	2	0	2	0	4	18	30
11 460.8	1.121	$0,g^+$								2	18	<25
11 461.5	1.131	$1,u$								1	18	<25
11 461.7	1.146	$1,g$	0	0	0	7	1	10	0	0	17	34
		$1,g$	0	0	0	7	−1	10	2	0	17	32
11 462.4	1.136	$2,u$								1	17	<25
11 462.5	1.121	$2,g$								2	18	<25
11 462.5	1.121	$0,u^+$								2	18	<25
11 462.6	1.110	$1,u$								3	18	<25
11 462.7	1.111	$1,g$								3	18	<25
11 463.8	1.121	$2,g$								2	18	<25
11 463.8	1.126	$1,g$	0	1	1	0	0	9	1	2	17	94
11 465.0	1.108	$1,g$								3	18	<25
11 465.7	1.113	$1,u$								3	18	<25
11 467.4	1.112	$1,u$								3	18	<25
11 468.3	1.119	$0,g^-$	0	0	2	6	−2	2	2	2	18	53
11 469.2	1.136	$2,g$	0	0	1	1	1	11	1	1	17	44
		$2,g$	0	0	1	1	−1	11	3	1	17	46
11 469.7	1.119	$2,g$								2	18	<25
11 469.8	1.127	$1,u$	1	1	0	0	0	9	1	2	17	37
		$1,u$	0	2	0	0	0	11	1	2	17	56
11 470.2	1.106	$2,g$	0	4	0	2	2	4	0	4	18	36
		$2,g$	0	4	0	2	0	4	2	4	18	38
11 470.8	1.135	$1,u$	0	1	0	8	8	7	−7	1	18	32
11 471.1	1.128	$1,u$	0	0	1	13	1	0	0	1	18	88
11 471.1	1.136	$2,u$	0	0	1	2	0	10	2	1	17	34
11 471.7	1.149	$1,u$	0	0	0	4	2	13	−1	0	17	29
		$1,u$	0	0	0	4	−2	13	3	0	17	30
11 471.8	1.138	$2,u$	0	1	0	1	1	13	1	1	17	28
		$2,u$	0	1	0	1	−1	13	3	1	17	27
11 472.8	1.103	$0,u^-$	0	3	1	2	−2	2	2	4	18	90
11 474.3	1.116	$0,g^+$	2	0	0	8	0	0	0	2	18	67
11 474.7	1.133	$1,u$	0	1	0	10	6	5	−5	1	18	27
		$1,u$	0	1	0	10	−4	5	5	1	18	26
11 476.8	1.133	$1,g$	0	1	0	11	−3	4	4	1	18	26
11 479.0	1.117	$2,g$	2	0	0	8	2	0	0	2	18	52
11 479.1	1.103	$2,u$	0	3	1	2	2	2	0	4	18	62
		$2,u$	0	3	1	2	0	2	2	4	18	29
11 479.6	1.106	$0,g^-$	0	4	0	2	−2	4	2	4	18	88
11 479.8	1.137	$0,g^+$	0	1	0	2	2	12	−2	1	17	26
		$0,g^+$	0	1	0	2	0	12	0	1	17	30
11 480.1	1.120	$0,u^-$	1	0	1	6	−2	2	2	2	18	54
11 480.4	1.120	$2,u$								2	18	<25
11 480.4	1.124	$0,g^-$	0	2	0	6	−6	6	6	2	18	42
11 483.9	1.133	$1,g$								1	18	<25
11 484.2	1.122	$0,g^+$	0	2	0	8	2	4	−2	2	18	28
		$0,g^+$	0	2	0	8	0	4	0	2	18	29
11 485.2	1.121	$0,u^+$								2	18	<25

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 486.6	1.133	1,*g*								1	18	<25
11 488.4	1.124	2,*g*	0	2	0	6	−4	6	6	2	18	27
11 489.5	1.112	1,*g*	0	2	1	4	2	3	−1	3	18	32
		1,*g*	0	2	1	4	−2	3	3	3	18	30
11 490.2	1.121	2,*u*								2	18	<25
11 490.9	1.122	2,*g*								2	18	<25
11 491.0	1.125	$0,u^+$	0	2	0	5	1	7	−1	2	18	34
11 491.5	1.121	$0,u^-$	1	1	0	7	−3	3	3	2	18	40
11 491.8	1.112	1,*u*	1	2	0	4	4	3	−3	3	18	29
11 492.8	1.137	2,*g*	0	1	0	2	0	12	2	1	17	30
11 493.1	1.132	1,*u*	0	1	0	12	−2	3	3	1	18	33
11 494.2	1.121	2,*u*								2	18	<25
11 495.1	1.106	2,*g*	0	4	0	2	2	4	0	4	18	30
		2,*g*	0	4	0	2	−2	4	4	4	18	60
11 495.6	1.122	$0,g^-$								2	18	<25
11 495.7	1.098	$0,u^+$	2	1	1	0	0	0	0	4	18	30
		$0,u^+$	0	1	3	0	0	0	0	4	18	45
11 496.3	1.121	2,*u*								2	18	<25
11 496.6	1.121	$0,g^+$								2	18	<25
11 497.2	1.102	$0,u^+$	0	3	1	2	2	2	−2	4	18	33
		$0,u^+$	0	3	1	2	0	2	0	4	18	48
11 497.8	1.122	2,*g*								2	18	<25
11 497.9	1.147	1,*u*	0	0	0	6	2	11	−1	0	17	26
		1,*u*	0	0	0	6	0	11	1	0	17	38
11 498.7	1.101	$0,g^+$	1	3	0	2	2	2	−2	4	18	32
11 499.5	1.110	1,*g*	0	1	2	3	3	2	−2	3	18	39
11 500.4	1.121	$0,u^+$	0	0	2	5	1	3	−1	2	18	25
11 501.8	1.122	2,*g*								2	18	<25
11 502.2	1.136	1,*g*								1	18	<25
11 502.5	1.114	1,*u*								3	18	<25
11 504.2	1.135	1,*u*	0	1	0	8	8	7	−7	1	18	26
11 504.2	1.124	$0,u^+$	0	2	0	7	3	5	−3	2	18	51
11 504.7	1.124	1,*u*	2	0	0	0	0	7	1	2	17	51
		1,*u*	0	2	0	0	0	11	1	2	17	30
11 505.9	1.103	2,*u*	0	3	1	2	2	2	0	4	18	33
		2,*u*	0	3	1	2	0	2	2	4	18	64
11 506.2	1.130	1,*g*	0	0	1	10	4	3	−3	1	18	38
11 506.4	1.150	1,*g*	0	0	0	3	3	14	−2	0	17	35
		1,*g*	0	0	0	3	−3	14	4	0	17	36
11 506.4	1.137	$0,u^+$	1	0	0	1	1	11	−1	1	17	67
		$0,u^+$	0	1	0	1	1	13	−1	1	17	32
11 507.2	1.098	$0,g^+$	1	1	2	0	0	0	0	4	18	65
11 507.6	1.125	2,*u*								2	18	<25
11 508.2	1.121	$0,g^+$	1	0	1	5	1	3	−1	2	18	25
11 508.3	1.121	2,*g*	1	0	1	5	5	3	−3	2	18	27
11 509.0	1.131	1,*u*								1	18	<25
11 510.0	1.119	$0,g^+$	0	0	2	6	2	2	−2	2	18	27
		$0,g^+$	0	0	2	6	0	2	0	2	18	36
11 511.0	1.109	1,*u*								3	18	<25
11 511.7	1.124	2,*u*	0	2	0	7	3	5	−1	2	18	28
11 512.5	1.129	1,*g*	1	0	0	11	3	2	−2	1	18	28
11 513.7	1.129	1,*u*	1	0	0	12	2	1	−1	1	18	29
		1,*u*	1	0	0	12	0	1	1	1	18	25
11 514.3	1.105	$0,g^+$	0	4	0	2	2	4	−2	4	18	35
		$0,g^+$	0	4	0	2	0	4	0	4	18	46
11 516.1	1.119	2,*g*	0	0	2	6	2	2	0	2	18	29
		2,*g*	0	0	2	6	0	2	2	2	18	31
11 516.3	1.110	1,*g*	0	1	2	3	−1	2	2	3	18	30
11 517.6	1.102	$0,g^-$	1	3	0	2	−2	2	2	4	18	81
11 517.7	1.137	$0,g^+$	1	0	0	2	2	10	−2	1	17	26
		$0,g^+$	1	0	0	2	0	10	0	1	17	31
11 518.1	1.130	1,*g*	0	1	0	13	1	2	0	1	18	41
11 518.2	1.118	2,*u*	2	0	0	7	3	1	−1	2	18	36
11 518.4	1.107	1,*u*	2	0	1	3	1	0	0	3	18	37

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		1,*u*	0	0	3	3	1	0	0	3	18	28
11 518.7	1.130	1,*u*	0	0	1	11	−1	2	2	1	18	31
11 519.0	1.144	2,*u*	0	0	0	11	7	7	−5	0	18	26
11 519.0	1.118	0,u^+	2	0	0	7	1	1	−1	2	18	41
11 520.0	1.102	2,*g*	1	3	0	2	2	2	0	4	18	47
11 520.3	1.137	2,*u*	1	0	0	1	1	11	1	1	17	34
		2,*u*	1	0	0	1	−1	11	3	1	17	33
11 521.4	1.131	1,*u*								1	18	<25
11 521.5	1.137	0,g^-	0	0	1	1	−1	11	1	1	17	96
11 522.4	1.123	0,g^+								2	18	<25
11 522.7	1.123	0,u^-								2	18	<25
11 523.7	1.144	2,*g*	0	0	0	12	6	6	−4	0	18	27
		2,*g*	0	0	0	12	4	6	−2	0	18	27
11 523.9	1.144	0,u^+	0	0	0	11	3	7	−3	0	18	33
		0,u^+	0	0	0	11	1	7	−1	0	18	43
11 525.0	1.132	1,*u*								1	18	<25
11 526.2	1.120	2,*u*								2	18	<25
11 526.3	1.105	2,*g*	0	4	0	2	0	4	2	4	18	45
11 526.3	1.119	0,u^+	1	0	1	6	0	2	0	2	18	35
11 526.5	1.123	0,u^-	0	0	2	5	−3	3	3	2	18	27
11 526.8	1.144	0,g^+	0	0	0	12	2	6	−2	0	18	43
		0,g^+	0	0	0	12	0	6	0	0	18	25
11 526.9	1.112	1,*u*								3	18	<25
11 527.0	1.121	0,g^-	0	1	1	7	−1	3	1	2	18	70
11 527.3	1.145	2,*g*	0	0	0	10	10	8	−8	0	18	27
		2,*g*	0	0	0	10	8	8	−6	0	18	25
11 528.4	1.131	1,*g*								1	18	<25
11 528.8	1.137	2,*g*								1	17	<25
11 528.8	1.112	1,*g*	0	2	1	4	2	3	−1	3	18	30
		1,*g*	0	2	1	4	0	3	1	3	18	46
11 529.0	1.093	1,*g*	0	4	1	0	0	1	1	5	18	99
11 529.7	1.128	1,*g*	1	0	0	13	1	0	0	1	18	46
11 530.5	1.123	2,*g*								2	18	<25
11 531.6	1.119	2,*u*								2	18	<25
11 533.2	1.110	1,*u*	1	1	1	3	3	2	−2	3	18	32
11 533.2	1.128	1,*g*	0	0	1	12	0	1	1	1	18	46
11 533.5	1.122	0,g^+								2	18	<25
11 533.7	1.145	0,g^+	0	0	0	10	4	8	−4	0	18	26
		0,g^+	0	0	0	10	2	8	−2	0	18	36
11 533.9	1.148	1,*g*	0	0	0	5	1	12	0	0	17	35
		1,*g*	0	0	0	5	−1	12	2	0	17	34
11 534.5	1.100	0,u^+	0	2	2	1	1	1	−1	4	18	73
11 534.8	1.116	1,*g*	0	3	0	3	1	6	0	3	18	27
11 534.8	1.121	0,u^+	1	1	0	7	3	3	−3	2	18	34
11 534.9	1.121	2,*g*	0	1	1	7	1	3	1	2	18	39
11 535.1	1.136	1,*g*								1	18	<25
11 535.9	1.124	1,*u*	2	0	0	0	0	7	1	2	17	31
		1,*u*	1	1	0	0	0	9	1	2	17	51
11 535.9	1.137	2,*g*	0	0	1	1	1	11	1	1	17	38
		2,*g*	0	0	1	1	−1	11	3	1	17	41
11 537.0	1.121	2,*g*								2	18	<25
11 537.2	1.121	0,g^-	1	0	1	5	−3	3	3	2	18	37
11 538.1	1.134	1,*g*								1	18	<25
11 538.3	1.123	0,g^+								2	18	<25
11 538.7	1.110	1,*g*	0	1	2	3	1	2	0	3	18	34
		1,*g*	0	1	2	3	−1	2	2	3	18	29
11 539.3	1.134	1,*u*								1	18	<25
11 539.3	1.121	2,*u*	1	1	0	7	−1	3	3	2	18	28
11 539.4	1.096	1,*u*	0	5	0	0	0	3	1	5	18	92
11 540.3	1.100	0,g^+	2	2	0	2	0	0	0	4	18	37
		0,g^+	1	3	0	2	2	2	−2	4	18	27
11 540.5	1.143	2,*u*	0	0	0	13	5	5	−3	0	18	30
		2,*u*	0	0	0	13	3	5	−1	0	18	29
11 540.8	1.151	1,*u*	0	0	0	2	2	15	−1	0	17	50

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		1,u	0	0	0	2	−2	15	3	0	17	50
11 541.0	1.138	0,u^-	1	0	0	1	−1	11	1	1	17	39
		0,u^-	0	1	0	1	−1	13	1	1	17	61
11 541.5	1.122	0,u^+								2	18	<25
11 541.5	1.100	0,u^-	0	2	2	1	−1	1	1	4	18	81
11 541.9	1.143	0,u^+	0	0	0	13	3	5	−3	0	18	34
		0,u^+	0	0	0	13	1	5	−1	0	18	55
11 543.9	1.123	2,g								2	18	<25
11 544.1	1.126	2,u								2	18	<25
11 544.1	1.109	1,u								3	18	<25
11 545.7	1.131	1,g								1	18	<25
11 546.0	1.121	0,u^-	0	1	1	6	−2	4	2	2	18	27
11 546.1	1.135	1,u	0	1	0	8	−6	7	7	1	18	26
11 547.5	1.122	2,g								2	18	<25
11 548.4	1.100	2,g	2	2	0	2	2	0	0	4	18	51
		2,g	1	3	0	2	0	2	2	4	18	28
11 548.6	1.101	0,g^+	1	3	0	2	0	2	0	4	18	44
11 549.3	1.100	2,u	0	2	2	1	1	1	1	4	18	80
11 549.8	1.122	0,g^-	0	1	1	5	−5	5	5	2	18	31
11 551.7	1.113	1,u								3	18	<25
11 554.0	1.121	2,u								2	18	<25
11 554.5	1.138	2,u	0	1	0	1	1	13	1	1	17	30
		2,u	0	1	0	1	−1	13	3	1	17	31
11 554.5	1.132	1,g	0	1	0	11	3	4	−2	1	18	27
11 554.5	1.102	2,g	1	3	0	2	2	2	0	4	18	36
11 555.8	1.122	2,u								2	18	<25
11 556.0	1.110	1,u								3	18	<25
11 556.3	1.120	0,u^+	0	0	2	5	3	3	−3	2	18	32
11 556.9	1.146	0,u^+	0	0	0	9	3	9	−3	0	18	30
		0,u^+	0	0	0	9	1	9	−1	0	18	36
11 557.0	1.108	1,g	1	0	2	1	1	2	0	3	18	35
		1,g	1	0	2	1	−1	2	2	3	18	29
11 558.3	1.110	1,u	1	1	1	3	1	2	0	3	18	34
11 559.1	1.133	1,u								1	18	<25
11 560.2	1.118	0,u^-	2	0	0	7	−1	1	1	2	18	64
11 560.6	1.120	2,u								2	18	<25
11 561.3	1.110	1,u								3	18	<25
11 561.3	1.125	0,u^+	0	2	0	5	5	7	−5	2	18	49
11 561.5	1.099	0,g^+	2	2	0	2	0	0	0	4	18	27
		0,g^+	1	2	1	1	1	1	−1	4	18	57
11 562.1	1.145	2,g	0	0	0	10	10	8	−8	0	18	38
11 563.0	1.146	2,u								0	18	<25
11 565.1	1.103	1,g	0	4	0	7	1	0	0	4	19	96
11 565.2	1.100	0,g^-	1	2	1	1	−1	1	1	4	18	90
11 565.8	1.144	2,u	0	0	0	11	9	7	−7	0	18	33
11 566.4	1.122	0,u^-	1	0	1	4	−4	4	4	2	18	28
11 566.6	1.136	1,g	0	1	0	7	−7	8	8	1	18	32
11 566.8	1.120	0,g^+	0	1	1	5	5	5	−5	2	18	29
11 568.0	1.110	1,u	2	1	0	4	0	1	1	3	18	33
11 568.5	1.131	1,u	0	0	1	9	5	4	−4	1	18	30
11 568.7	1.118	2,u	2	0	0	7	1	1	1	2	18	32
11 568.8	1.144	0,u^-	0	0	0	11	−7	7	7	0	18	27
		0,u^-	0	0	0	11	−5	7	5	0	18	42
		0,u^-	0	0	0	11	−3	7	3	0	18	27
11 568.9	1.116	1,g	0	3	0	3	3	6	−2	3	18	27
		1,g	0	3	0	3	−3	6	4	3	18	34
11 569.1	1.142	2,g	0	0	0	14	4	4	−2	0	18	35
		2,g	0	0	0	14	2	4	0	0	18	29
11 569.2	1.142	0,g^+	0	0	0	14	2	4	−2	0	18	50
		0,g^+	0	0	0	14	0	4	0	0	18	33
11 569.4	1.123	0,u^-	0	2	0	7	−1	5	1	2	18	43
11 569.6	1.145	0,g^-	0	0	0	10	−8	8	8	0	18	25
		0,g^-	0	0	0	10	−6	8	6	0	18	37
		0,g^-	0	0	0	10	−4	8	4	0	18	28

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 569.7	1.149	1,*u*	0	0	0	4	2	13	−1	0	17	25
		1,*u*	0	0	0	4	0	13	1	0	17	42
11 571.7	1.130	1,*g*								1	18	<25
11 572.6	1.119	2,*g*	2	0	0	6	4	2	−2	2	18	37
11 572.6	1.120	$0,g^+$								2	18	<25
11 573.3	1.112	1,*u*								3	18	<25
11 573.7	1.121	2,*g*								2	18	<25
11 574.2	1.136	1,*u*								1	18	<25
11 574.3	1.122	$0,g^-$								2	18	<25
11 574.5	1.133	1,*g*								1	18	<25
11 574.7	1.131	1,*u*	0	0	1	9	−3	4	4	1	18	27
11 574.9	1.152	1,*g*	0	0	0	1	1	16	0	0	17	50
		1,*g*	0	0	0	1	−1	16	2	0	17	50
11 575.1	1.100	2,*g*	1	2	1	1	1	1	1	4	18	78
11 575.3	1.132	1,*g*								1	18	<25
11 576.9	1.125	2,*u*	0	2	0	5	−5	7	7	2	18	31
11 577.1	1.092	1,*u*	1	4	0	0	0	1	1	5	18	92
11 577.2	1.121	$0,g^+$	1	1	0	6	4	4	−4	2	18	31
11 577.4	1.124	2,*u*								2	18	<25
11 579.2	1.131	1,*u*	0	1	0	12	2	3	−1	1	18	25
		1,*u*	0	1	0	12	0	3	1	1	18	33
11 579.8	1.111	1,*u*								3	18	<25
11 580.1	1.133	1,*u*								1	18	<25
11 580.5	1.131	1,*g*								1	18	<25
11 580.8	1.144	2,*g*	0	0	0	12	8	6	−6	0	18	32
11 581.1	1.110	1,*u*								3	18	<25
11 581.1	1.108	1,*g*	1	0	2	1	−1	2	2	3	18	47
11 581.4	1.144	$0,g^-$	0	0	0	12	−6	6	6	0	18	33
		$0,g^-$	0	0	0	12	−4	6	4	0	18	47
11 582.7	1.122	2,*g*	1	1	0	6	−2	4	4	2	18	28
11 582.9	1.137	$0,u^-$	1	0	0	1	−1	11	1	1	17	60
		$0,u^-$	0	1	0	1	−1	13	1	1	17	39
11 584.2	1.122	2,*g*								2	18	<25
11 585.5	1.112	1,*g*								3	18	<25
11 585.5	1.146	$0,u^-$	0	0	0	9	−9	9	9	0	18	28
		$0,u^-$	0	0	0	9	−7	9	7	0	18	32
		$0,u^-$	0	0	0	9	−5	9	5	0	18	26
11 585.5	1.122	$0,u^-$								2	18	<25
11 585.7	1.131	1,*g*								1	18	<25
11 585.8	1.137	$0,u^+$	0	0	1	0	0	12	0	1	17	96
11 586.5	1.120	$0,g^+$								2	18	<25
11 587.8	1.122	$0,u^+$								2	18	<25
11 588.4	1.129	1,*u*	1	0	0	12	0	1	1	1	18	31
11 590.2	1.124	$0,g^-$	0	2	0	6	−2	6	2	2	18	35
11 591.6	1.122	2,*u*								2	18	<25
11 593.0	1.122	2,*u*								2	18	<25
11 593.1	1.122	$0,g^-$	0	1	1	5	−5	5	5	2	18	27
11 593.4	1.132	1,*u*								1	18	<25
11 593.9	1.121	2,*g*								2	18	<25
11 593.9	1.122	$0,u^+$	1	0	1	4	4	4	−4	2	18	42
11 594.5	1.131	1,*u*								1	18	<25
11 595.1	1.137	2,*u*	1	0	0	1	−1	11	3	1	17	31
11 595.7	1.147	$0,g^+$	0	0	0	8	4	10	−4	0	18	26
		$0,g^+$	0	0	0	8	2	10	−2	0	18	36
11 596.5	1.126	$0,g^+$	0	2	0	4	2	8	−2	2	18	32
11 597.4	1.120	$0,u^-$	0	0	2	5	−1	3	1	2	18	53
11 600.1	1.134	1,*g*								1	18	<25
11 600.2	1.124	2,*g*								2	18	<25
11 600.2	1.137	2,*u*	0	0	1	0	0	12	2	1	17	82
11 600.5	1.122	2,*u*								2	18	<25
11 600.5	1.134	1,*u*								1	18	<25
11 602.0	1.139	$0,g^+$	1	0	0	0	0	12	0	1	17	36
		$0,g^+$	0	1	0	0	0	14	0	1	17	64
11 602.5	1.120	$0,g^-$	2	0	0	6	−2	2	2	2	18	39

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 602.8	1.113	1,u								3	18	<25
11 603.6	1.133	1,g	1	0	0	7	7	6	−6	1	18	27
11 604.2	1.146	2,u	0	0	0	9	9	9	−7	0	18	28
11 604.9	1.124	0,u^-	1	1	0	5	−5	5	5	2	18	30
11 605.0	1.136	1,g								1	18	<25
11 605.2	1.120	2,u	0	0	2	5	1	3	1	2	18	34
11 605.4	1.150	1,g	0	0	0	3	1	14	0	0	17	40
		1,g	0	0	0	3	−1	14	2	0	17	39
11 606.7	1.143	0,u^-	0	0	0	13	−5	5	5	0	18	43
		0,u^-	0	0	0	13	−3	5	3	0	18	48
11 607.0	1.145	2,g								0	18	<25
11 607.4	1.110	1,g								3	18	<25
11 607.5	1.143	2,u	0	0	0	13	7	5	−5	0	18	34
11 608.0	1.147	2,g								0	18	<25
11 608.1	1.145	0,g^+	0	0	0	10	8	8	−8	0	18	52
11 608.4	1.141	0,u^+	0	0	0	15	3	3	−3	0	18	29
		0,u^+	0	0	0	15	1	3	−1	0	18	71
11 608.7	1.122	0,u^-	1	0	1	4	−4	4	4	2	18	26
11 609.1	1.133	1,u								1	18	<25
11 609.1	1.106	0,u^+	0	4	0	1	1	5	−1	4	18	82
11 609.4	1.141	2,u	0	0	0	15	5	3	−3	0	18	26
		2,u	0	0	0	15	3	3	−1	0	18	41
		2,u	0	0	0	15	1	3	1	0	18	26
11 609.7	1.114	1,g								3	18	<25
11 609.9	1.120	2,g								2	18	<25
11 609.9	1.103	0,g^+	0	3	1	1	1	3	−1	4	18	90
11 610.9	1.146	0,u^+	0	0	0	9	9	9	−9	0	18	57
11 612.2	1.126	2,g								2	18	<25
11 612.8	1.110	1,g								3	18	<25
11 613.6	1.121	0,g^+	0	0	2	4	4	4	−4	2	18	34
11 614.5	1.136	1,u								1	18	<25
11 614.8	1.133	1,u								1	18	<25
11 615.6	1.122	0,u^+	0	1	1	6	2	4	−2	2	18	43
		0,u^+	0	1	1	6	0	4	0	2	18	41
11 615.9	1.139	2,g	1	0	0	0	0	12	2	1	17	36
		2,g	0	1	0	0	0	14	2	1	17	64
11 615.9	1.120	0,g^-	1	0	1	5	−1	3	1	2	18	42
11 616.6	1.121	2,g								2	18	<25
11 617.2	1.124	2,u								2	18	<25
11 617.2	1.095	0,g^+	0	5	0	4	0	0	0	5	19	99
11 619.0	1.111	1,u	0	1	2	2	2	3	−1	3	18	27
		1,u	0	1	2	2	0	3	1	3	18	26
11 619.1	1.144	0,u^+	0	0	0	11	7	7	−7	0	18	54
11 619.6	1.112	0,g^+	0	3	0	10	0	0	0	3	19	90
11 620.2	1.144	2,u	0	0	0	11	9	7	−7	0	18	27
11 621.3	1.095	2,g	0	5	0	4	2	0	0	5	19	99
11 622.6	1.121	0,g^-	1	1	0	6	−2	4	2	2	18	37
11 623.1	1.122	0,u^+								2	18	<25
11 623.6	1.112	2,g	0	3	0	10	2	0	0	3	19	91
11 624.8	1.104	2,g	0	3	1	1	1	3	1	4	18	42
		2,g	0	3	1	1	−1	3	3	4	18	48
11 624.8	1.122	2,u	0	1	1	6	2	4	0	2	18	28
		2,u	0	1	1	6	0	4	2	2	18	40
11 625.0	1.106	2,u	0	4	0	1	1	5	1	4	18	45
		2,u	0	4	0	1	−1	5	3	4	18	40
11 625.6	1.120	2,g								2	18	<25
11 628.8	1.121	2,g								2	18	<25
11 629.0	1.132	1,g	1	0	0	9	−3	4	4	1	18	27
11 629.4	1.109	1,g								3	18	<25
11 630.2	1.123	0,u^-								2	18	<25
11 630.4	1.121	2,u	2	0	0	5	5	3	−3	2	18	35
11 630.4	1.109	1,g								3	18	<25
11 631.6	1.147	0,g^-	0	0	0	8	−8	10	8	0	18	25
		0,g^-	0	0	0	8	−6	10	6	0	18	37

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,g^-$	0	0	0	8	−4	10	4	0	18	28
11 631.9	1.122	$0,u^+$	1	1	0	5	5	5	−5	2	18	32
11 632.1	1.131	$1,u$	1	0	0	10	−2	3	3	1	18	26
11 633.0	1.133	$1,g$								1	18	<25
11 633.1	1.122	$2,u$								2	18	<25
11 634.0	1.111	$1,u$	0	1	2	2	2	3	−1	3	18	27
		$1,u$	0	1	2	2	−2	3	3	3	18	39
11 635.0	1.104	$0,g^-$	0	3	1	1	−1	3	1	4	18	97
11 635.2	1.122	$0,g^+$								2	18	<25
11 637.2	1.132	$1,g$	0	0	1	8	−4	5	5	1	18	30
11 637.2	1.126	$0,g^-$	0	2	0	4	−4	8	4	2	18	41
11 637.9	1.132	$1,u$								1	18	<25
11 638.1	1.122	$2,u$								2	18	<25
11 638.8	1.132	$1,g$	0	1	0	11	1	4	0	1	18	27
11 640.0	1.123	$0,g^+$	1	0	1	3	1	5	−1	2	18	26
11 640.8	1.151	$1,u$	0	0	0	2	0	15	1	0	17	53
11 641.3	1.132	$1,u$								1	18	<25
11 642.3	1.113	$1,u$	0	2	1	3	1	4	0	3	18	44
		$1,u$	0	2	1	3	−1	4	2	3	18	33
11 642.9	1.134	$1,u$								1	18	<25
11 643.0	1.144	$0,g^+$	0	0	0	12	6	6	−6	0	18	60
11 643.1	1.111	$1,g$								3	18	<25
11 643.1	1.146	$0,u^-$	0	0	0	9	−9	9	9	0	18	57
11 643.7	1.133	$1,g$								1	18	<25
11 644.3	1.122	$2,g$								2	18	<25
11 644.4	1.142	$0,g^-$	0	0	0	14	−4	4	4	0	18	58
		$0,g^-$	0	0	0	14	−2	4	2	0	18	42
11 644.5	1.121	$0,g^-$	0	0	2	4	−2	4	2	2	18	44
11 645.3	1.144	$2,g$	0	0	0	12	8	6	−6	0	18	29
11 646.2	1.142	$2,g$	0	0	0	14	6	4	−4	0	18	38
		$2,g$	0	0	0	14	0	4	2	0	18	30
11 646.2	1.106	$0,u^-$	0	4	0	1	−1	5	1	4	18	78
11 646.2	1.120	$0,g^+$	2	0	0	6	0	2	0	2	18	29
11 646.6	1.104	$2,g$	0	3	1	1	1	3	1	4	18	54
		$2,g$	0	3	1	1	−1	3	3	4	18	43
11 647.6	1.122	$2,u$								2	18	<25
11 647.6	1.120	$0,u^+$								2	18	<25
11 647.9	1.107	$1,g$	3	0	0	3	1	0	0	3	18	37
11 647.9	1.148	$0,u^+$	0	0	0	7	3	11	−3	0	18	33
		$0,u^+$	0	0	0	7	1	11	−1	0	18	43
11 648.0	1.133	$1,u$	0	0	1	7	−5	6	6	1	18	26
11 648.2	1.138	$0,g^+$	1	0	0	0	0	12	0	1	17	64
		$0,g^+$	0	1	0	0	0	14	0	1	17	36
11 648.3	1.130	$1,g$								1	18	<25
11 648.4	1.146	$2,u$	0	0	0	9	9	9	−7	0	18	25
11 649.3	1.122	$0,u^-$	0	1	1	4	−4	6	4	2	18	29
11 649.9	1.110	$1,g$	1	1	1	2	−2	3	3	3	18	25
11 650.4	1.102	$0,u^+$	1	3	0	1	1	3	−1	4	18	54
11 651.5	1.147	$2,g$								0	18	<25
11 651.9	1.122	$2,g$								2	18	<25
11 653.2	1.135	$1,g$								1	18	<25
11 653.4	1.104	$1,u$	0	4	0	6	2	1	−1	4	19	58
		$1,u$	0	4	0	6	0	1	1	4	19	38
11 653.7	1.124	$2,g$								2	18	<25
11 653.7	1.109	$1,g$	1	1	1	2	2	3	−1	3	18	29
11 654.5	1.123	$0,g^+$								2	18	<25
11 654.6	1.145	$0,g^-$	0	0	0	10	−8	8	8	0	18	57
11 654.9	1.131	$1,g$	0	0	1	10	0	3	1	1	18	36
11 655.0	1.111	$1,u$	0	1	2	2	0	3	1	3	18	42
11 656.9	1.121	$2,g$								2	18	<25
11 657.0	1.123	$2,g$								2	18	<25
11 657.1	1.136	$1,u$								1	18	<25
11 658.7	1.137	$1,g$								1	18	<25
11 658.9	1.145	$2,g$								0	18	<25

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 659.6	1.140	$0,g^+$	0	0	0	16	2	2	−2	0	18	52
		$0,g^+$	0	0	0	16	0	2	0	0	18	48
11 659.7	1.124	$0,u^+$	0	2	0	5	3	7	−3	2	18	26
11 659.9	1.106	$2,u$	0	4	0	1	1	5	1	4	18	32
		$2,u$	0	4	0	1	−1	5	3	4	18	47
11 660.1	1.115	$1,g$								3	18	<25
11 660.9	1.135	$1,u$								1	18	<25
11 661.5	1.140	$2,g$	0	0	0	16	4	2	−2	0	18	38
		$2,g$	0	0	0	16	2	2	0	0	18	46
11 661.6	1.138	$2,g$	1	0	0	0	0	12	2	1	17	64
		$2,g$	0	1	0	0	0	14	2	1	17	36
11 662.8	1.148	$2,u$								0	18	<25
11 663.9	1.123	$2,g$								2	18	<25
11 665.2	1.121	$0,u^-$	1	0	1	4	−2	4	2	2	18	28
11 665.6	1.134	$1,g$	0	0	1	6	6	7	−5	1	18	26
11 665.8	1.113	$0,u^+$	0	3	0	9	1	1	−1	3	19	91
11 666.6	1.110	$1,g$								3	18	<25
11 667.1	1.122	$2,u$								2	18	<25
11 668.1	1.103	$2,u$	1	3	0	1	1	3	1	4	18	30
		$2,u$	1	3	0	1	−1	3	3	4	18	38
11 668.2	1.122	$2,u$								2	18	<25
11 669.0	1.113	$2,u$	0	3	0	9	3	1	−1	3	19	59
		$2,u$	0	3	0	9	1	1	1	3	19	32
11 669.4	1.120	$0,u^-$	2	0	0	5	−3	3	3	2	18	41
11 670.1	1.147	$0,g^+$	0	0	0	8	8	10	−8	0	18	52
11 670.5	1.116	$1,u$	0	3	0	2	0	7	1	3	18	32
11 672.6	1.122	$2,u$								2	18	<25
11 672.7	1.134	$1,g$	0	0	1	6	−6	7	7	1	18	37
11 673.0	1.099	$0,u^+$	2	1	1	0	0	0	0	4	18	30
11 673.8	1.134	$1,g$								1	18	<25
11 674.0	1.123	$0,g^+$								2	18	<25
11 674.3	1.123	$0,g^-$	1	0	1	3	−3	5	3	2	18	33
11 675.4	1.122	$2,u$								2	18	<25
11 675.9	1.134	$1,u$								1	18	<25
11 676.1	1.152	$1,g$	0	0	0	1	1	16	0	0	17	50
		$1,g$	0	0	0	1	−1	16	2	0	17	50
11 676.4	1.111	$1,g$	1	1	1	2	0	3	1	3	18	31
11 676.6	1.123	$0,u^+$								2	18	<25
11 678.1	1.144	$0,u^-$	0	0	0	11	−7	7	7	0	18	58
		$0,u^-$	0	0	0	11	−3	7	3	0	18	32
11 678.9	1.102	$0,u^-$	2	2	0	1	−1	1	1	4	18	30
		$0,u^-$	1	3	0	1	−1	3	1	4	18	45
11 679.5	1.143	$0,u^+$	0	0	0	13	5	5	−5	0	18	68
		$0,u^+$	0	0	0	13	1	5	−1	0	18	28
11 680.5	1.123	$0,u^+$								2	18	<25
11 681.1	1.101	$0,g^+$	0	2	2	0	0	2	0	4	18	81
11 681.4	1.123	$2,g$								2	18	<25
11 682.3	1.144	$2,u$	0	0	0	11	−5	7	7	0	18	27
11 682.5	1.143	$2,u$	0	0	0	13	7	5	−5	0	18	30
		$2,u$	0	0	0	13	−3	5	5	0	18	27
11 682.7	1.111	$1,g$								3	18	<25
11 684.4	1.123	$0,g^+$								2	18	<25
11 685.4	1.113	$1,g$								3	18	<25
11 685.6	1.123	$0,g^+$								2	18	<25
11 685.9	1.121	$0,u^+$								2	18	<25
11 686.4	1.123	$0,g^+$								2	18	<25
11 687.2	1.146	$0,u^+$	0	0	0	9	9	9	−9	0	18	34
11 688.6	1.124	$2,u$								2	18	<25
11 689.3	1.098	$0,u^+$	2	1	1	0	0	0	0	4	18	26
		$0,u^+$	2	2	0	1	1	1	−1	4	18	42
11 689.5	1.132	$1,u$	1	0	0	8	−4	5	5	1	18	26
11 691.0	1.147	$2,g$	0	0	0	8	−8	10	10	0	18	30
11 691.5	1.123	$2,g$								2	18	<25
11 691.6	1.102	$2,u$	2	2	0	1	1	1	1	4	18	30

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		2,u	1	3	0	1	−1	3	3	4	18	41
11 692.3	1.132	1,g								1	18	<25
11 692.8	1.109	1,u	1	0	2	0	0	3	1	3	18	56
11 692.8	1.148	0,u^-	0	0	0	7	−7	11	7	0	18	27
		0,u^-	0	0	0	7	−5	11	5	0	18	42
		0,u^-	0	0	0	7	−3	11	3	0	18	27
11 694.1	1.121	2,g	0	0	2	4	0	4	2	2	18	33
11 694.2	1.141	0,u^-	0	0	0	15	−3	3	3	0	18	79
11 694.6	1.122	2,u								2	18	<25
11 694.8	1.110	1,g	2	0	1	0	0	3	1	3	18	32
		1,g	0	0	3	0	0	3	1	3	18	46
11 695.1	1.101	2,g	0	2	2	0	0	2	2	4	18	80
11 696.6	1.146	2,u	0	0	0	9	−7	9	9	0	18	32
11 696.9	1.141	2,u	0	0	0	15	5	3	−3	0	18	43
		2,u	0	0	0	15	−1	3	3	0	18	31
11 697.3	1.132	1,u								1	18	<25
11 697.7	1.101	0,u^-	2	2	0	1	−1	1	1	4	18	55
		0,u^-	1	3	0	1	−1	3	1	4	18	33
11 698.3	1.104	1,u	0	4	0	6	2	1	−1	4	19	38
		1,u	0	4	0	6	0	1	1	4	19	59
11 698.7	1.112	1,g								3	18	<25
11 699.4	1.133	1,u								1	18	<25
11 699.4	1.133	1,g	1	0	0	7	−5	6	6	1	18	27
11 699.9	1.125	2,g								2	18	<25
11 699.9	1.121	2,u								2	18	<25
11 700.3	1.122	0,u^-	0	0	2	3	−3	5	3	2	18	49
11 701.5	1.132	1,g								1	18	<25
11 701.8	1.123	2,g								2	18	<25
11 702.0	1.101	2,u	2	2	0	1	1	1	1	4	18	35
		2,u	1	3	0	1	1	3	1	4	18	38
11 703.5	1.123	0,g^-	0	1	1	5	−1	5	1	2	18	71
11 704.6	1.134	1,u	1	0	0	6	−6	7	7	1	18	26
11 705.1	1.120	0,u^+								2	18	<25
11 706.8	1.100	0,u^+	1	2	1	0	0	2	0	4	18	87
11 707.3	1.137	1,g								1	18	<25
11 708.7	1.132	1,u								1	18	<25
11 708.9	1.121	2,u								2	18	<25
11 709.3	1.136	1,u								1	18	<25
11 709.7	1.134	1,g								1	18	<25
11 710.0	1.122	0,u^+	1	1	0	5	3	5	−3	2	18	32
11 710.7	1.148	2,u								0	18	<25
11 711.3	1.152	1,u	0	0	0	0	0	17	1	0	17	100
11 711.6	1.145	0,g^+	0	0	0	10	8	8	−8	0	18	39
11 712.2	1.127	0,u^+	0	2	0	3	1	9	−1	2	18	43
11 712.8	1.122	0,g^+								2	18	<25
11 712.8	1.149	0,g^+	0	0	0	6	2	12	−2	0	18	43
		0,g^+	0	0	0	6	0	12	0	0	18	25
11 713.8	1.144	0,g^-	0	0	0	12	−6	6	6	0	18	58
		0,g^-	0	0	0	12	−2	6	2	0	18	36
11 714.0	1.123	2,g	0	1	1	5	1	5	1	2	18	37
		2,g	0	1	1	5	−1	5	3	2	18	32
11 714.2	1.114	1,u	0	3	0	2	−2	7	3	3	18	34
11 714.7	1.123	0,g^-	1	1	0	4	−4	6	4	2	18	40
11 715.3	1.114	1,g	0	2	1	2	2	5	−1	3	18	38
		1,g	0	2	1	2	−2	5	3	3	18	37
11 715.5	1.131	1,u	0	0	1	9	1	4	0	1	18	31
		1,u	0	0	1	9	−1	4	2	1	18	28
11 715.7	1.113	1,u								3	18	<25
11 716.6	1.147	0,g^-	0	0	0	8	−8	10	8	0	18	57
11 717.4	1.134	1,u								1	18	<25
11 717.6	1.122	2,u								2	18	<25
11 718.2	1.144	2,g	0	0	0	12	−4	6	6	0	18	33
11 718.3	1.145	2,g	0	0	0	10	−6	8	8	0	18	32
11 718.9	1.136	1,g								1	18	<25

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 719.7	1.122	2,u								2	18	<25
11 720.8	1.121	0,g^+								2	18	<25
11 722.3	1.100	2,u	1	2	1	0	0	2	2	4	18	77
11 722.7	1.123	0,u^-	1	1	0	5	−1	5	1	2	18	25
11 722.8	1.139	0,u^+	0	0	0	17	1	1	−1	0	18	100
11 723.5	1.114	0,g^+	0	3	0	8	2	2	−2	3	19	49
		0,g^+	0	3	0	8	0	2	0	3	19	41
11 723.7	1.135	1,g								1	18	<25
11 725.4	1.139	2,u	0	0	0	17	3	1	−1	0	18	59
		2,u	0	0	0	17	1	1	1	0	18	41
11 725.6	1.114	2,g	0	3	0	8	4	2	−2	3	19	44
		2,g	0	3	0	8	2	2	0	3	19	36
11 726.2	1.108	1,u								3	18	<25
11 726.7	1.123	2,g								2	18	<25
11 728.1	1.127	2,u								2	18	<25
11 728.1	1.113	0,u^-	0	3	0	9	−1	1	1	3	19	92
11 728.3	1.149	2,g	0	0	0	6	2	12	0	0	18	25
11 728.3	1.142	0,g^+	0	0	0	14	4	4	−4	0	18	74
11 731.6	1.122	0,u^+	0	0	2	3	3	5	−3	2	18	38
11 731.7	1.134	1,u								1	18	<25
11 731.9	1.142	2,g	0	0	0	14	6	4	−4	0	18	30
		2,g	0	0	0	14	−2	4	4	0	18	37
11 732.2	1.147	2,g	0	0	0	8	−8	10	10	0	18	39
11 732.2	1.122	0,u^-	0	1	1	4	−2	6	2	2	18	29
11 732.6	1.120	0,g^-	2	0	0	4	−4	4	4	2	18	52
11 732.7	1.123	2,u								2	18	<25
11 732.8	1.123	2,g	1	0	1	3	−3	5	5	2	18	25
11 732.9	1.113	2,u	0	3	0	9	3	1	−1	3	19	33
		2,u	0	3	0	9	1	1	1	3	19	60
11 735.5	1.135	1,u								1	18	<25
11 735.9	1.121	2,g								2	18	<25
11 739.2	1.123	0,g^+	0	1	1	3	1	7	−1	2	18	29
11 739.9	1.109	1,u								3	18	<25
11 740.2	1.123	0,u^-	2	0	0	5	−1	3	1	2	18	31
		0,u^-	0	2	0	5	−1	7	1	2	18	34
11 742.5	1.125	0,g^-	0	2	0	4	−2	8	2	2	18	29
11 742.9	1.123	2,u								2	18	<25
11 743.1	1.148	0,u^+	0	0	0	7	7	11	−7	0	18	54
11 743.4	1.146	0,u^-	0	0	0	9	−7	9	7	0	18	49
		0,u^-	0	0	0	9	−3	9	3	0	18	27
11 744.5	1.122	2,u								2	18	<25
11 746.6	1.112	1,g	0	1	2	1	1	4	0	3	18	37
		1,g	0	1	2	1	−1	4	2	3	18	31
11 747.3	1.144	0,u^+	0	0	0	11	7	7	−7	0	18	37
		0,u^+	0	0	0	11	5	7	−5	0	18	32
11 748.8	1.096	0,u^+	0	5	0	3	1	1	−1	5	19	98
11 749.2	1.133	1,g								1	18	<25
11 751.0	1.096	2,u	0	5	0	3	3	1	−1	5	19	82
11 751.1	1.123	2,u								2	18	<25
11 752.1	1.123	0,g^+	1	1	0	4	4	6	−4	2	18	31
11 752.5	1.110	1,u	3	0	0	2	2	1	−1	3	18	28
11 752.7	1.124	2,g								2	18	<25
11 752.7	1.133	1,u								1	18	<25
11 753.0	1.124	0,u^+								2	18	<25
11 753.1	1.146	2,u	0	0	0	9	−7	9	9	0	18	31
11 753.3	1.144	2,u	0	0	0	11	−5	7	7	0	18	32
11 753.4	1.105	1,g	0	4	0	5	3	2	−2	4	19	42
		1,g	0	4	0	5	1	2	0	4	19	38
11 755.1	1.133	1,g								1	18	<25
11 755.2	1.114	1,g	0	2	1	2	2	5	−1	3	18	25
		1,g	0	2	1	2	0	5	1	3	18	51
11 755.5	1.138	1,u								1	18	<25
11 755.6	1.124	2,g								2	18	<25
11 756.2	1.140	0,g^-	0	0	0	16	−2	2	2	0	18	100

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 756.6	1.134	1,*u*								1	18	<25
11 758.3	1.110	1,*u*								3	18	<25
11 758.6	1.120	0,g^+	2	0	0	4	4	4	−4	2	18	26
11 759.5	1.140	2,*g*	0	0	0	16	4	2	−2	0	18	47
		2,*g*	0	0	0	16	0	2	2	0	18	49
11 759.9	1.148	2,*u*	0	0	0	7	−7	11	9	0	18	30
11 760.3	1.135	1,*g*								1	18	<25
11 761.9	1.143	0,u^-	0	0	0	13	−5	5	5	0	18	54
11 762.2	1.133	1,*u*								1	18	<25
11 762.4	1.124	0,u^-	1	1	0	5	−1	5	1	2	18	31
11 763.2	1.136	1,*g*								1	18	<25
11 763.4	1.109	1,*u*	2	0	1	1	1	2	0	3	18	32
11 763.4	1.127	0,u^-	0	2	0	3	−3	9	3	2	18	48
11 764.5	1.135	1,*g*								1	18	<25
11 764.6	1.123	2,*g*								2	18	<25
11 765.2	1.111	1,*u*								3	18	<25
11 766.5	1.143	2,*u*	0	0	0	13	5	5	−3	0	18	26
		2,*u*	0	0	0	13	−3	5	5	0	18	36
11 766.8	1.123	0,g^-	0	2	0	4	−2	8	2	2	18	26
11 767.4	1.149	0,g^-	0	0	0	6	−6	12	6	0	18	33
		0,g^-	0	0	0	6	−4	12	4	0	18	47
11 767.9	1.121	2,*g*								2	18	<25
11 768.4	1.112	1,*u*								3	18	<25
11 768.6	1.124	2,*u*								2	18	<25
11 769.0	1.135	1,*u*								1	18	<25
11 769.5	1.133	1,*g*								1	18	<25
11 769.8	1.112	1,*g*	0	1	2	1	1	4	0	3	18	35
		1,*g*	0	1	2	1	−1	4	2	3	18	40
11 770.9	1.124	2,*u*								2	18	<25
11 771.7	1.123	0,g^-	0	1	1	3	−3	7	3	2	18	47
11 772.4	1.105	0,u^+	0	3	1	0	0	4	0	4	18	96
11 772.5	1.122	0,u^-	0	0	2	3	−1	5	1	2	18	55
11 773.6	1.147	0,g^+	0	0	0	8	8	10	−8	0	18	39
11 774.4	1.096	0,u^-	0	5	0	3	−1	1	1	5	19	100
11 775.1	1.114	0,g^-	0	3	0	8	−2	2	2	3	19	92
11 775.4	1.111	1,*u*								3	18	<25
11 775.9	1.132	1,*g*	0	0	1	8	0	5	1	1	18	32
11 777.1	1.136	1,*u*	0	0	1	5	−5	8	6	1	18	25
11 777.3	1.107	0,g^+	0	4	0	0	0	6	0	4	18	75
11 778.3	1.123	2,*g*								2	18	<25
11 778.7	1.127	2,*u*								2	18	<25
11 779.1	1.114	2,*g*	0	3	0	8	4	2	−2	3	19	39
		2,*g*	0	3	0	8	0	2	2	3	19	43
11 779.7	1.086	1,*g*	0	6	0	1	1	0	0	6	19	100
11 779.8	1.145	0,g^-	0	0	0	10	−6	8	6	0	18	50
		0,g^-	0	0	0	10	−2	8	2	0	18	33
11 780.4	1.096	2,*u*	0	5	0	3	1	1	1	5	19	82
11 783.1	1.122	2,*u*	0	0	2	3	1	5	1	2	18	30
		2,*u*	0	0	2	3	−1	5	3	2	18	27
11 783.7	1.149	2,*g*								0	18	<25
11 784.3	1.111	1,*u*	2	1	0	2	2	3	−1	3	18	28
11 785.3	1.121	1,*g*	0	2	0	13	1	0	0	2	19	77
11 785.8	1.123	0,g^+	0	0	2	2	2	6	−2	2	18	35
11 785.9	1.105	2,*u*	0	3	1	0	0	4	2	4	18	96
11 786.1	1.147	2,*g*								0	18	<25
11 787.2	1.123	2,*g*	0	1	1	3	−3	7	5	2	18	29
11 787.5	1.105	1,*g*	0	4	0	5	3	2	−2	4	19	43
		1,*g*	0	4	0	5	−1	2	2	4	19	48
11 787.5	1.145	2,*g*	0	0	0	10	−6	8	8	0	18	26
11 788.8	1.135	1,*g*								1	18	<25
11 789.3	1.141	0,u^+	0	0	0	15	3	3	−3	0	18	71
		0,u^+	0	0	0	15	1	3	−1	0	18	29
11 789.9	1.150	0,u^+	0	0	0	5	3	13	−3	0	18	34
		0,u^+	0	0	0	5	1	13	−1	0	18	55

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 790.1	1.122	1,u	0	2	0	12	2	1	−1	2	19	45
		1,u	0	2	0	12	0	1	1	2	19	35
11 790.8	1.124	0,u^+	0	1	1	4	2	6	−2	2	18	45
		0,u^+	0	1	1	4	0	6	0	2	18	43
11 791.4	1.111	0,u^+	0	2	1	8	0	0	0	3	19	86
11 792.1	1.107	2,g	0	4	0	0	0	6	2	4	18	78
11 792.8	1.115	0,u^+	0	3	0	7	3	3	−3	3	19	29
		0,u^+	0	3	0	7	1	3	−1	3	19	60
11 793.3	1.141	2,u	0	0	0	15	5	3	−3	0	18	26
		2,u	0	0	0	15	3	3	−1	0	18	28
		2,u	0	0	0	15	−1	3	3	0	18	43
11 793.5	1.111	1,u	1	1	1	1	1	4	0	3	18	27
11 793.5	1.115	2,u	0	3	0	7	5	3	−3	3	19	38
		2,u	0	3	0	7	3	3	−1	3	19	33
11 794.7	1.121	0,g^-	2	0	0	4	−2	4	2	2	18	34
11 794.9	1.144	0,g^+	0	0	0	12	6	6	−6	0	18	31
		0,g^+	0	0	0	12	4	6	−4	0	18	48
11 795.5	1.111	2,u	0	2	1	8	2	0	0	3	19	87
11 795.7	1.135	1,g								1	18	<25
11 797.0	1.112	1,u								3	18	<25
11 797.5	1.124	0,u^+	1	1	0	3	1	7	−1	2	18	38
11 797.5	1.122	0,g^-	1	0	1	3	−1	5	1	2	18	38
		0,g^-	1	1	0	4	−2	6	2	2	18	27
11 797.8	1.124	0,u^-	1	0	1	2	−2	6	2	2	18	33
11 797.8	1.138	0,g^+	0	0	0	18	0	0	0	0	18	100
11 799.9	1.102	1,u	0	3	1	5	1	0	0	4	19	95
11 800.0	1.122	2,g								2	18	<25
11 800.6	1.144	2,g	0	0	0	12	6	6	−4	0	18	26
		2,g	0	0	0	12	−4	6	6	0	18	29
11 801.0	1.138	2,g	0	0	0	18	2	0	0	0	18	100
11 802.1	1.148	0,u^-	0	0	0	7	−7	11	7	0	18	58
		0,u^-	0	0	0	7	−3	11	3	0	18	32
11 802.4	1.124	2,u	0	1	1	4	0	6	2	2	18	42
11 803.6	1.096	0,g^+	3	1	0	0	0	0	0	4	18	78
11 804.8	1.121	2,g								2	18	<25
11 805.4	1.150	2,u	0	0	0	5	1	13	1	0	18	29
		2,u	0	0	0	5	−1	13	3	0	18	25
11 806.4	1.123	1,g	0	2	0	11	3	2	−2	2	19	28
		1,g	0	2	0	11	1	2	0	2	19	37
11 807.3	1.123	2,g								2	18	<25
11 807.7	1.124	0,g^+								2	18	<25
11 808.3	1.134	1,u								1	18	<25
11 811.3	1.146	0,u^+	0	0	0	9	7	9	−7	0	18	41
11 811.7	1.135	1,g								1	18	<25
11 811.9	1.124	2,u								2	18	<25
11 812.5	1.133	1,u								1	18	<25
11 813.1	1.134	1,g								1	18	<25
11 813.4	1.124	2,u								2	18	<25
11 813.8	1.138	1,u								1	18	<25
11 816.4	1.148	2,u	0	0	0	7	7	11	−5	0	18	25
		2,u	0	0	0	7	−7	11	9	0	18	34
11 817.0	1.113	1,u								3	18	<25
11 817.1	1.136	1,u								1	18	<25
11 817.1	1.103	0,g^+	1	3	0	0	0	4	0	4	18	45
11 818.3	1.123	0,g^-	0	0	2	2	−2	6	2	2	18	63
11 818.6	1.124	0,g^+	0	1	1	3	3	7	−3	2	18	44
11 818.7	1.117	1,g	0	3	0	1	1	8	0	3	18	33
		1,g	0	3	0	1	−1	8	2	3	18	32
11 818.9	1.124	2,g								2	18	<25
11 820.8	1.146	2,u								0	18	<25
11 821.2	1.110	0,g^+	1	2	0	8	0	0	0	3	19	49
11 821.4	1.124	0,u^+	0	2	0	3	3	9	−3	2	18	25
11 822.1	1.142	0,g^-	0	0	0	14	−4	4	4	0	18	42
		0,g^-	0	0	0	14	−2	4	2	0	18	58

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 822.5	1.135	1,g								1	18	<25
11 822.6	1.135	1,u								1	18	<25
11 825.0	1.123	0,u^+	2	0	0	3	1	5	−1	2	18	26
11 825.5	1.110	2,g	1	2	0	8	2	0	0	3	19	51
11 826.3	1.136	1,g								1	18	<25
11 826.7	1.123	0,g^+	2	0	0	4	0	4	0	2	18	26
11 826.8	1.115	1,u	0	2	1	1	1	6	0	3	18	38
		1,u	0	2	1	1	−1	6	2	3	18	36
11 826.9	1.142	2,g	0	0	0	14	4	4	−2	0	18	33
		2,g	0	0	0	14	−2	4	4	0	18	32
11 827.3	1.144	0,u^-	0	0	0	11	−5	7	5	0	18	52
11 828.7	1.105	1,g	0	4	0	5	1	2	0	4	19	39
		1,g	0	4	0	5	−1	2	2	4	19	31
11 829.0	1.149	0,g^+	0	0	0	6	6	12	−6	0	18	60
11 830.1	1.134	1,u								1	18	<25
11 830.1	1.124	2,g	0	0	2	2	−2	6	4	2	18	26
11 830.1	1.139	0,u^-	0	0	0	17	−1	1	1	0	18	100
11 830.2	1.103	2,g	2	2	0	0	0	2	2	4	18	27
		2,g	1	3	0	0	0	4	2	4	18	48
11 833.2	1.124	1,u	0	2	0	10	2	3	−1	2	19	32
11 833.5	1.123	2,g	0	1	1	3	−3	7	5	2	18	27
11 833.9	1.139	2,u	0	0	0	17	3	1	−1	0	18	41
		2,u	0	0	0	17	1	1	1	0	18	59
11 834.0	1.115	0,u^-	0	3	0	7	−3	3	3	3	19	75
11 834.3	1.144	2,u								0	18	<25
11 835.5	1.136	1,g	0	0	1	4	−4	9	5	1	18	28
11 835.5	1.125	2,u								2	18	<25
11 836.1	1.124	0,u^-	1	1	0	3	−3	7	3	2	18	48
11 836.2	1.133	1,u	0	0	1	7	1	6	0	1	18	26
		1,u	0	0	1	7	−1	6	2	1	18	26
11 836.3	1.114	0,g^+	0	3	0	8	2	2	−2	3	19	37
		0,g^+	0	3	0	8	0	2	0	3	19	53
11 836.6	1.115	2,u	0	3	0	7	5	3	−3	3	19	39
		2,u	0	3	0	7	1	3	1	3	19	29
11 838.1	1.123	2,g								2	18	<25
11 840.2	1.102	1,g	1	3	0	5	1	0	0	4	19	73
11 840.6	1.122	2,u								2	18	<25
11 840.6	1.128	0,g^+	0	2	0	2	2	10	−2	2	18	32
		0,g^+	0	2	0	2	0	10	0	2	18	28
11 841.8	1.147	0,g^-	0	0	0	8	−6	10	6	0	18	50
		0,g^-	0	0	0	8	−2	10	2	0	18	33
11 841.9	1.114	2,g	0	3	0	8	2	2	0	3	19	48
		2,g	0	3	0	8	0	2	2	3	19	34
11 843.1	1.101	0,g^+	2	2	0	0	0	2	0	4	18	56
		0,g^+	1	3	0	0	0	4	0	4	18	30
11 844.2	1.149	2,g	0	0	0	6	6	12	−4	0	18	28
		2,g	0	0	0	6	−6	12	8	0	18	33
11 845.1	1.136	1,u								1	18	<25
11 845.6	1.109	1,g								3	18	<25
11 850.0	1.121	0,u^-	2	0	0	3	−3	5	3	2	18	45
		0,u^-	1	0	1	2	−2	6	2	2	18	36
11 850.1	1.124	2,u	1	1	0	3	−3	7	5	2	18	29
11 850.9	1.124	0,g^+								2	18	<25
11 851.4	1.124	0,u^+								2	18	<25
11 853.0	1.147	2,g	0	0	0	8	−6	10	8	0	18	28
11 853.8	1.101	2,g	2	2	0	0	0	2	2	4	18	58
		2,g	1	3	0	0	0	4	2	4	18	30
11 854.5	1.143	0,u^+	0	0	0	13	3	5	−3	0	18	62
11 854.7	1.150	0,u^-	0	0	0	5	−5	13	5	0	18	43
		0,u^-	0	0	0	5	−3	13	3	0	18	48
11 855.9	1.128	2,g	0	2	0	2	0	10	2	2	18	28
11 859.2	1.145	0,g^+	0	0	0	10	6	8	−6	0	18	38
		0,g^+	0	0	0	10	4	8	−4	0	18	38
11 859.9	1.125	0,u^+	0	1	1	2	2	8	−2	2	18	37

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
		$0,u^+$	0	1	1	2	0	8	0	2	18	30
11 859.9	1.123	$0,g^+$	0	0	2	2	2	6	−2	2	18	28
		$0,g^+$	0	0	2	2	0	6	0	2	18	37
11 860.2	1.143	$2,u$	0	0	0	13	−1	5	3	0	18	28
11 860.3	1.124	$2,g$								2	18	<25
11 862.3	1.140	$0,g^+$	0	0	0	16	2	2	−2	0	18	48
		$0,g^+$	0	0	0	16	0	2	0	0	18	52
11 862.3	1.111	$0,g^+$	1	2	0	8	0	0	0	3	19	28
		$0,g^+$	0	2	1	7	1	1	−1	3	19	56
11 862.8	1.122	$2,u$	2	0	0	3	−3	5	5	2	18	40
11 864.4	1.139	$1,g$	0	1	0	3	1	12	0	1	18	26
11 864.6	1.111	$2,g$	1	2	0	8	2	0	0	3	19	27
		$2,g$	0	2	1	7	3	1	−1	3	19	43
11 865.0	1.123	$2,u$	1	0	1	2	−2	6	4	2	18	28
11 865.1	1.112	$1,g$								3	18	<25
11 865.4	1.106	$1,u$	0	4	0	4	4	3	−3	4	19	39
		$1,u$	0	4	0	4	2	3	−1	4	19	32
11 866.8	1.140	$2,g$	0	0	0	16	2	2	0	0	18	51
		$2,g$	0	0	0	16	0	2	2	0	18	34
11 867.0	1.135	$1,g$								1	18	<25
11 867.2	1.136	$1,u$								1	18	<25
11 867.4	1.145	$2,g$	0	0	0	10	−4	8	6	0	18	27
11 867.5	1.115	$1,u$	0	2	1	1	1	6	0	3	18	50
		$1,u$	0	2	1	1	−1	6	2	3	18	44
11 869.6	1.122	$1,u$	0	2	0	12	2	1	−1	2	19	36
		$1,u$	0	2	0	12	0	1	1	2	19	45
11 869.7	1.134	$1,g$								1	18	<25
11 870.0	1.150	$2,u$	0	0	0	5	−3	13	5	0	18	26
11 871.2	1.124	$1,g$	0	2	0	9	3	4	−2	2	19	26
11 871.3	1.148	$0,u^+$	0	0	0	7	7	11	−7	0	18	37
		$0,u^+$	0	0	0	7	5	11	−5	0	18	32
11 871.6	1.123	$2,g$	0	0	2	2	0	6	2	2	18	38
11 872.9	1.115	$1,g$	0	3	0	1	1	8	0	3	18	25
		$1,g$	0	3	0	1	−1	8	2	3	18	25
11 873.3	1.135	$1,u$								1	18	<25
11 873.4	1.116	$2,g$	0	3	0	6	6	4	−4	3	19	42
		$2,g$	0	3	0	6	4	4	−2	3	19	28
11 873.6	1.111	$0,u^+$	1	2	0	7	1	1	−1	3	19	39
11 873.9	1.116	$0,g^+$	0	3	0	6	2	4	−2	3	19	42
		$0,g^+$	0	3	0	6	0	4	0	3	19	26
11 874.9	1.125	$2,u$	0	1	1	2	0	8	2	2	18	29
11 875.1	1.123	$1,g$	0	2	0	11	3	2	−2	2	19	41
		$1,g$	0	2	0	11	−1	2	2	2	19	41
11 877.5	1.125	$0,g^-$	0	1	1	3	−1	7	1	2	18	78
11 877.9	1.111	$2,u$	1	2	0	7	3	1	−1	3	19	29
11 879.2	1.151	$0,g^+$	0	0	0	4	2	14	−2	0	18	50
		$0,g^+$	0	0	0	4	0	14	0	0	18	33
11 879.3	1.108	$1,g$	3	0	0	1	−1	2	2	3	18	51
11 879.4	1.138	$1,u$								1	18	<25
11 879.5	1.125	$0,g^+$	1	0	1	1	1	7	−1	2	18	32
11 882.8	1.136	$1,g$	0	0	1	4	4	9	−3	1	18	25
		$1,g$	0	0	1	4	−4	9	5	1	18	31
11 883.4	1.113	$1,u$	0	1	2	0	0	5	1	3	18	76
11 883.4	1.124	$0,u^+$	1	1	0	3	3	7	−3	2	18	33
11 883.9	1.148	$2,u$								0	18	<25
11 884.1	1.114	$0,u^+$	0	3	0	7	3	3	−3	3	19	51
		$0,u^+$	0	3	0	7	1	3	−1	3	19	33
11 884.2	1.135	$1,u$	0	0	1	5	−3	8	4	1	18	27
11 885.4	1.108	$1,g$	3	0	0	1	1	2	0	3	18	26
		$1,g$	2	0	1	0	0	3	1	3	18	32
11 886.5	1.122	$0,u^+$	1	0	1	2	2	6	−2	2	18	27
		$0,u^+$	1	0	1	2	0	6	0	2	18	37
11 886.7	1.144	$0,g^-$	0	0	0	12	−4	6	4	0	18	47
		$0,g^-$	0	0	0	12	−2	6	2	0	18	44

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 888.6	1.106	1,u	0	4	0	4	4	3	−3	4	19	41
		1,u	0	4	0	4	0	3	1	4	19	26
		1,u	0	4	0	4	−2	3	3	4	19	28
11 889.0	1.115	2,u	0	3	0	7	3	3	−1	3	19	37
		2,u	0	3	0	7	−1	3	3	3	19	37
11 890.1	1.125	2,g	0	1	1	3	1	7	1	2	18	37
		2,g	0	1	1	3	−1	7	3	2	18	38
11 890.5	1.146	0,u^-	0	0	0	9	−5	9	5	0	18	50
11 890.6	1.134	1,g								1	18	<25
11 890.9	1.125	0,u^-	1	1	0	3	−1	7	1	2	18	33
		0,u^-	0	2	0	3	−1	9	1	2	18	31
11 892.0	1.124	1,u	0	2	0	10	4	3	−3	2	19	37
		1,u	0	2	0	10	−2	3	3	2	19	29
11 892.7	1.096	0,g^+	0	5	0	2	2	2	−2	5	19	60
		0,g^+	0	5	0	2	0	2	0	5	19	37
11 893.2	1.137	1,u	0	0	1	3	1	10	0	1	18	27
		1,u	0	0	1	3	−1	10	2	1	18	26
11 893.3	1.144	2,g	0	0	0	12	4	6	−2	0	18	28
		2,g	0	0	0	12	−2	6	4	0	18	30
11 894.2	1.119	1,u	1	0	1	9	1	0	0	2	19	29
		1,u	0	1	1	11	1	0	0	2	19	65
11 894.3	1.151	2,g	0	0	0	4	2	14	0	0	18	27
		2,g	0	0	0	4	0	14	2	0	18	33
11 894.4	1.125	2,g								2	18	<25
11 894.4	1.141	0,u^-	0	0	0	15	−1	3	1	0	18	79
11 894.9	1.123	2,u								2	18	<25
11 896.2	1.134	1,g	0	0	1	6	0	7	1	1	18	26
11 896.7	1.109	0,g^+	1	0	2	4	0	0	0	3	19	31
		0,g^+	0	1	2	6	0	0	0	3	19	39
11 897.2	1.122	2,u	1	0	1	2	0	6	2	2	18	36
11 899.4	1.141	2,u	0	0	0	15	3	3	−1	0	18	30
		2,u	0	0	0	15	1	3	1	0	18	46
11 899.8	1.149	0,g^-	0	0	0	6	−6	12	6	0	18	58
		0,g^-	0	0	0	6	−2	12	2	0	18	36
11 899.9	1.146	2,u	0	0	0	9	−5	9	7	0	18	25
11 900.5	1.109	2,g	1	0	2	4	2	0	0	3	19	29
		2,g	0	1	2	6	2	0	0	3	19	38
11 900.9	1.137	1,g								1	18	<25
11 901.0	1.112	1,g								3	18	<25
11 902.2	1.112	0,g^-	0	2	1	7	−1	1	1	3	19	89
11 902.4	1.120	1,g								2	19	<25
11 902.4	1.127	0,g^-	1	1	0	2	−2	8	2	2	18	32
		0,g^-	0	2	0	2	−2	10	2	2	18	55
11 903.1	1.125	2,u								2	18	<25
11 903.5	1.103	1,g	0	3	1	4	2	1	−1	4	19	57
		1,g	0	3	1	4	0	1	1	4	19	29
11 904.7	1.123	0,u^+	0	0	2	1	1	7	−1	2	18	65
11 905.1	1.116	0,g^-	0	3	0	6	−4	4	4	3	19	60
		0,g^-	0	3	0	6	−2	4	2	3	19	31
11 905.2	1.115	2,g	0	3	0	6	6	4	−4	3	19	35
11 905.2	1.125	0,u^-	0	1	1	2	−2	8	2	2	18	77
11 907.0	1.096	0,g^-	0	5	0	2	−2	2	2	5	19	99
11 907.7	1.112	2,g	0	2	1	7	1	1	1	3	19	65
11 908.4	1.113	1,g	2	1	0	1	−1	4	2	3	18	29
11 908.8	1.109	0,u^+	2	0	1	4	0	0	0	3	19	27
11 911.0	1.096	2,g	0	5	0	2	2	2	0	5	19	67
		2,g	0	5	0	2	0	2	2	5	19	30
11 912.1	1.112	1,g	1	1	1	0	0	5	1	3	18	66
11 912.3	1.109	2,u	2	0	1	4	2	0	0	3	19	28
		2,u	0	0	3	4	2	0	0	3	19	25
11 913.4	1.149	2,g	0	0	0	6	6	12	−4	0	18	27
		2,g	0	0	0	6	−6	12	8	0	18	31
11 913.5	1.123	0,u^-	2	0	0	3	−1	5	1	2	18	47
		0,u^-	0	2	0	3	−1	9	1	2	18	27

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 913.7	1.093	$0,u^+$	0	4	1	2	0	0	0	5	19	99
11 916.6	1.127	$2,g$	0	2	0	2	2	10	0	2	18	26
		$2,g$	0	2	0	2	−2	10	4	2	18	29
11 917.5	1.124	$2,u$	0	0	2	1	−1	7	3	2	18	30
		$2,u$	0	1	1	2	2	8	0	2	18	27
11 917.8	1.093	$2,u$	0	4	1	2	2	0	0	5	19	99
11 918.5	1.144	$0,u^+$	0	0	0	11	5	7	−5	0	18	28
		$0,u^+$	0	0	0	11	3	7	−3	0	18	55
11 919.0	1.106	$1,u$	0	4	0	4	2	3	−1	4	19	31
		$1,u$	0	4	0	4	−2	3	3	4	19	45
11 920.0	1.125	$1,g$	0	2	0	9	5	4	−4	2	19	33
11 920.8	1.125	$1,u$								2	19	<25
11 920.8	1.124	$2,u$	0	0	2	1	1	7	1	2	18	29
		$2,u$	0	1	1	2	−2	8	4	2	18	34
11 921.2	1.147	$0,g^+$	0	0	0	8	6	10	−6	0	18	38
		$0,g^+$	0	0	0	8	4	10	−4	0	18	38
11 921.5	1.125	$0,g^+$	1	1	0	2	2	8	−2	2	18	32
		$0,g^+$	1	1	0	2	0	8	0	2	18	26
11 922.5	1.120	$1,u$								2	19	<25
11 922.8	1.137	$1,g$								1	18	<25
11 925.3	1.136	$1,u$	1	0	0	4	−4	9	5	1	18	26
11 925.4	1.123	$2,u$	2	0	0	3	1	5	1	2	18	26
11 926.0	1.144	$2,u$	0	0	0	11	−3	7	5	0	18	26
11 926.2	1.142	$0,g^+$	0	0	0	14	2	4	−2	0	18	50
		$0,g^+$	0	0	0	14	0	4	0	0	18	42
11 926.6	1.135	$1,u$								1	18	<25
11 927.5	1.150	$0,u^+$	0	0	0	5	5	13	−5	0	18	68
		$0,u^+$	0	0	0	5	1	13	−1	0	18	28
11 929.4	1.096	$0,g^+$	0	5	0	2	2	2	−2	5	19	38
		$0,g^+$	0	5	0	2	0	2	0	5	19	57
11 931.6	1.112	$0,u^-$	1	2	0	7	−1	1	1	3	19	50
11 931.7	1.147	$2,g$								0	18	<25
11 932.0	1.142	$2,g$	0	0	0	14	2	4	0	0	18	38
		$2,g$	0	0	0	14	0	4	2	0	18	35
11 932.8	1.138	$1,g$								1	18	<25
11 933.3	1.112	$2,u$	0	2	1	6	4	2	−2	3	19	43
11 933.6	1.136	$1,g$								1	18	<25
11 933.9	1.112	$0,u^+$	0	2	1	6	2	2	−2	3	19	34
		$0,u^+$	0	2	1	6	0	2	0	3	19	25
11 935.2	1.103	$1,g$	0	3	1	4	2	1	−1	4	19	34
		$1,g$	0	3	1	4	0	1	1	4	19	63
11 935.4	1.124	$0,g^-$	2	0	0	2	−2	6	2	2	18	29
		$0,g^-$	0	2	0	2	−2	10	2	2	18	31
11 935.5	1.110	$0,g^+$	0	1	2	6	0	0	0	3	19	28
11 935.9	1.125	$2,g$	1	1	0	2	0	8	2	2	18	26
11 936.0	1.113	$1,g$								3	18	<25
11 938.1	1.112	$2,u$	1	2	0	7	3	1	−1	3	19	28
11 938.6	1.096	$2,g$	0	5	0	2	2	2	0	5	19	28
		$2,g$	0	5	0	2	0	2	2	5	19	69
11 938.7	1.109	$2,g$	1	0	2	4	2	0	0	3	19	32
		$2,g$	0	1	2	6	2	0	0	3	19	30
11 939.7	1.102	$1,u$	1	3	0	4	2	1	−1	4	19	47
		$1,u$	1	3	0	4	0	1	1	4	19	28
11 939.7	1.125	$0,u^-$	1	1	0	3	−1	7	1	2	18	39
11 940.9	1.122	$0,g^+$	2	0	0	2	2	6	−2	2	18	31
		$0,g^+$	1	0	1	1	1	7	−1	2	18	33
11 941.4	1.114	$0,g^+$	0	3	0	6	4	4	−4	3	19	56
11 941.8	1.150	$2,u$	0	0	0	5	5	13	−3	0	18	32
		$2,u$	0	0	0	5	−5	13	7	0	18	36
11 942.2	1.137	$1,u$	0	0	1	3	3	10	−2	1	18	30
		$1,u$	0	0	1	3	−3	10	4	1	18	34
11 943.8	1.136	$1,g$	0	0	1	4	2	9	−1	1	18	26
		$1,g$	0	0	1	4	−2	9	3	1	18	29
11 945.1	1.114	$0,u^-$	0	3	0	7	−1	3	1	3	19	67

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\,^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 945.7	1.115	2,*g*	0	3	0	6	−2	4	4	3	19	29
11 947.0	1.119	1,*g*								2	19	<25
11 947.2	1.124	0,u^-	0	0	2	1	−1	7	1	2	18	67
11 947.7	1.108	0,u^+	1	1	1	6	0	0	0	3	19	52
11 949.1	1.124	2,*g*								2	18	<25
11 949.5	1.109	2,*u*	1	1	1	6	2	0	0	3	19	49
11 950.0	1.125	2,*u*								2	18	<25
11 950.0	1.145	0,g^-	0	0	0	10	−4	8	4	0	18	48
		0,g^-	0	0	0	10	−2	8	2	0	18	39
11 951.0	1.135	1,*u*								1	18	<25
11 951.3	1.148	0,u^-	0	0	0	7	−5	11	5	0	18	52
11 951.5	1.114	2,*u*	0	3	0	7	1	3	1	3	19	42
11 952.2	1.122	1,*g*								2	19	<25
11 953.0	1.111	0,g^+								3	19	<25
11 954.2	1.122	1,*g*	0	2	0	11	1	2	0	2	19	32
11 954.3	1.151	0,g^-	0	0	0	4	−4	14	4	0	18	58
		0,g^-	0	0	0	4	−2	14	2	0	18	42
11 955.0	1.137	1,*u*								1	18	<25
11 955.5	1.111	2,*g*								3	19	<25
11 955.8	1.122	2,*g*								2	18	<25
11 956.6	1.093	0,g^+	1	4	0	2	0	0	0	5	19	93
11 957.2	1.136	1,*u*								1	18	<25
11 958.0	1.143	0,u^-	0	0	0	13	−3	5	3	0	18	27
		0,u^-	0	0	0	13	−1	5	1	0	18	69
11 958.4	1.145	2,*g*	0	0	0	10	4	8	−2	0	18	26
		2,*g*	0	0	0	10	−2	8	4	0	18	26
11 958.5	1.105	1,*u*	0	4	0	4	0	3	1	4	19	40
11 958.7	1.124	1,*u*	0	2	0	10	−2	3	3	2	19	34
11 959.7	1.125	1,*u*	0	2	0	8	6	5	−5	2	19	30
11 959.9	1.124	2,*u*	0	0	2	1	1	7	1	2	18	33
		2,*u*	0	0	2	1	−1	7	3	2	18	35
11 960.5	1.093	2,*g*	1	4	0	2	2	0	0	5	19	94
11 962.9	1.148	2,*u*	0	0	0	7	5	11	−3	0	18	25
		2,*u*	0	0	0	7	−5	11	7	0	18	27
11 962.9	1.087	1,*u*	0	6	0	0	0	1	1	6	19	100
11 963.8	1.126	0,u^+	0	1	1	2	2	8	−2	2	18	43
		0,u^+	0	1	1	2	0	8	0	2	18	52
11 964.4	1.143	2,*u*	0	0	0	13	1	5	1	0	18	39
11 967.8	1.116	0,u^+	0	3	0	5	3	5	−3	3	19	29
		0,u^+	0	3	0	5	1	5	−1	3	19	40
11 968.9	1.151	2,*g*	0	0	0	4	4	14	−2	0	18	29
		2,*g*	0	0	0	4	−4	14	6	0	18	29
11 970.7	1.125	0,g^-	1	1	0	2	−2	8	2	2	18	57
11 971.3	1.112	0,u^-	1	2	0	7	−1	1	1	3	19	26
		0,u^-	0	2	1	6	−2	2	2	3	19	59
11 971.4	1.100	1,*g*	0	2	2	3	1	0	0	4	19	76
11 973.0	1.127	0,g^+								2	18	<25
11 974.1	1.120	1,*u*								2	19	<25
11 974.2	1.119	1,*g*	0	0	2	9	1	0	0	2	19	51
		1,*g*	1	1	0	11	1	0	0	2	19	38
11 975.5	1.112	2,*u*								3	19	<25
11 976.3	1.124	1,*g*	0	2	0	9	5	4	−4	2	19	26
		1,*g*	0	2	0	9	−3	4	4	2	19	31
11 977.0	1.126	2,*u*	0	1	1	2	0	8	2	2	18	50
11 977.5	1.122	0,g^-	2	0	0	2	−2	6	2	2	18	40
		0,g^-	1	0	1	1	−1	7	1	2	18	52
11 978.0	1.103	1,*u*	1	3	0	4	2	1	−1	4	19	29
		1,*u*	1	3	0	4	0	1	1	4	19	45
11 979.3	1.117	1,*u*	1	2	0	0	0	7	1	3	18	32
		1,*u*	0	3	0	0	0	9	1	3	18	59
11 979.5	1.116	1,*g*	0	2	1	0	0	7	1	3	18	94
11 980.1	1.116	2,*u*	0	3	0	5	3	5	−1	3	19	27
11 980.4	1.152	0,u^+	0	0	0	3	3	15	−3	0	18	29
		0,u^+	0	0	0	3	1	15	−1	0	18	71

TABLE 14. Predicted vibrational energy, principal rotational constants (all in cm^{-1}), and fraction of basis states of the $^{13}C_2H_2$, $\tilde{X}\ ^1\Sigma_g^+$ vibrational eigenstates up to 12 000 cm^{-1}, calculated from the results and model provided in Di Lonardo *et al.*[32] —Continued

G_v	B_v	k,sy	v_1	v_2	v_3	v_4	l_4	v_5	l_5	N_s	N_r	%
11 980.7	1.120	1,g	0	1	1	10	2	1	−1	2	19	28
		1,g	0	1	1	10	0	1	1	2	19	40
11 980.9	1.149	0,g^+	0	0	0	6	6	12	−6	0	18	31
		0,g^+	0	0	0	6	4	12	−4	0	18	48
11 981.2	1.146	0,u^+	0	0	0	9	5	9	−5	0	18	30
		0,u^+	0	0	0	9	3	9	−3	0	18	53
11 981.5	1.128	0,u^+	1	1	0	1	1	9	−1	2	18	31
		0,u^+	0	2	0	1	1	11	−1	2	18	57
11 983.2	1.137	1,g								1	18	<25
11 983.2	1.126	1,g								2	19	<25
11 983.3	1.114	0,g^-	1	2	0	6	−2	2	2	3	19	30
11 983.4	1.136	1,g								1	18	<25
11 983.6	1.125	2,g	1	1	0	2	−2	8	4	2	18	32
11 984.7	1.133	0,g^+	0	1	0	12	2	4	−2	1	19	36
11 984.9	1.110	0,u^+	0	1	2	5	1	1	−1	3	19	44
11 985.4	1.133	2,g	0	1	0	12	4	4	−2	1	19	27
11 985.4	1.140	1,u	0	1	0	2	0	13	1	1	18	33
11 986.0	1.127	2,g								2	18	<25
11 986.4	1.133	0,u^+	0	1	0	13	1	3	−1	1	19	34
11 987.3	1.133	2,u								1	19	<25
11 987.9	1.110	2,u	0	1	2	5	3	1	−1	3	19	38
11 989.2	1.120	1,u								2	19	<25
11 989.5	1.144	0,g^+	0	0	0	12	2	6	−2	0	18	49
		0,g^+	0	0	0	12	0	6	0	0	18	37
11 989.8	1.113	2,g								3	19	<25
11 989.8	1.117	0,u^-	0	3	0	5	−5	5	5	3	19	54
		0,u^-	0	3	0	5	−3	5	3	3	19	31
11 989.9	1.122	2,g	2	0	0	2	−2	6	4	2	18	26
11 990.4	1.146	2,u	0	0	0	9	−3	9	5	0	18	27
11 990.6	1.120	1,u	1	1	0	10	2	1	−1	2	19	30
11 991.3	1.100	1,u	1	2	1	3	1	0	0	4	19	79
11 991.5	1.126	0,g^+	0	1	1	1	1	9	−1	2	18	80
11 992.9	1.122	1,u								2	19	<25
11 993.2	1.136	1,u								1	18	<25
11 993.3	1.149	2,g	0	0	0	6	−4	12	6	0	18	26
11 995.2	1.152	2,u	0	0	0	3	1	15	1	0	18	36
		2,u	0	0	0	3	−1	15	3	0	18	35
11 995.8	1.113	0,g^-	0	3	0	6	−2	4	2	3	19	40
11 996.2	1.128	2,u	0	2	0	1	1	11	1	2	18	29
		2,u	0	2	0	1	−1	11	3	2	18	28
11 996.3	1.110	0,g^+								3	19	<25
11 996.6	1.144	2,g	0	0	0	12	2	6	0	0	18	33
		2,g	0	0	0	12	0	6	2	0	18	35
11 997.7	1.109	1,u	3	0	0	0	0	3	1	3	18	73
11 997.7	1.134	2,u								1	19	<25
11 997.9	1.134	0,u^+	0	1	0	11	1	5	−1	1	19	30