

PERIODIC TABLE

Atomic Properties of the Elements

Physical Measurement Laboratory www.nist.gov/pml
Standard Reference Data www.nist.gov/srd

FREQUENTLY USED FUNDAMENTAL PHYSICAL CONSTANTS §

1 second = 9 192 631 770 periods of radiation corresponding to the transition between the two hyperfine levels of the ground state of ¹³³Cs

speed of light in vacuum	<i>c</i>	299 792 458 m s ⁻¹	(exact)
Planck constant	<i>h</i>	6.626 070 15 × 10 ⁻³⁴ J Hz ⁻¹	(exact)
elementary charge	<i>e</i>	1.602 176 634 × 10 ⁻¹⁹ C	(exact)
Avogadro constant	<i>N_A</i>	6.022 140 76 × 10 ²³ mol ⁻¹	(exact)
Boltzmann constant	<i>k</i>	1.380 649 × 10 ⁻²³ J K ⁻¹	(exact)
molar gas constant	<i>R</i>	8.314 462 618... J mol ⁻¹ K ⁻¹	(exact)
electron volt	eV	1.602 176 634 × 10 ⁻¹⁹ J	(exact)
electron energy	<i>m_ec²</i>	0.510 998 950 MeV	
proton energy	<i>m_pc²</i>	938.272 088 MeV	
fine-structure constant	<i>α</i>	1/137.035 999	
Rydberg frequency	<i>R_∞c</i>	3.289 841 960 × 10 ¹⁵ Hz	
	<i>R_∞hc</i>	13.605 693 123 eV	
Newtonian constant of gravitation	<i>G</i>	6.674 × 10 ⁻¹¹ m ³ kg ⁻¹ s ⁻²	

§ For the most accurate values of these and other constants, visit pml.nist.gov/constants.

Solids
 Liquids
 Gases
 Artificially Prepared

Group

1

IA

1

1

H

Hydrogen

1.008

1s

13.5984

2

IIA

4

2

Be

Beryllium

9.0122

1s²2s²

9.3227

3

Li

Lithium

6.94

1s²2s

5.3917

11

Na

Sodium

22.990

[Ne]3s

5.1391

12

Mg

Magnesium

24.305

[Ne]3s²

7.6462

19

K

Potassium

39.098

[Ar]4s

4.3407

20

Ca

Calcium

40.078

[Ar]4s²

6.1132

37

Rb

Rubidium

85.468

[Kr]5s

4.1771

38

Sr

Strontium

87.62

[Kr]5s²

5.6949

55

Cs

Cesium

132.91

[Xe]6s

3.8939

87

Fr

Francium

(223)

[Rn]7s

4.0727

2

He

Helium

4.0026

1s²

24.5874

10

Ne

Neon

20.180

1s²2s²2p⁶

21.5645

18

Ar

Argon

39.948

[Ne]3s²3p⁶

15.7596

36

Kr

Krypton

83.798

[Ar]3d¹⁰4s²4p⁶

13.9996

54

Xe

Xenon

131.29

[Kr]4d¹⁰5s²5p⁶

12.1298

86

Rn

Radon

(222)

[Hg]6p⁶

10.7485

13

B

Boron

10.81

1s²2s²2p

5.9858

14

C

Carbon

12.011

1s²2s²2p²

8.2980

15

N

Nitrogen

14.007

1s²2s²2p³

14.5341

16

O

Oxygen

15.999

1s²2s²2p⁴

13.6181

17

F

Fluorine

18.998

1s²2s²2p⁵

17.4228

35

Br

Bromine

79.904

[Ar]3d¹⁰4s²4p⁵

11.8138

53

I

Iodine

126.90

[Kr]4d¹⁰5s²5p⁵

10.4513

85

At

Astatine

(210)

[Hg]6p⁵

9.3175

6

C

Carbon

12.011

1s²2s²2p²

11.2603

7

N

Nitrogen

14.007

1s²2s²2p³

10.4867

8

O

Oxygen

15.999

1s²2s²2p⁴

10.3600

9

F

Fluorine

18.998

1s²2s²2p⁵

12.9676

16

S

Sulfur

32.06

[Ne]3s²3p⁴

10.3600

34

Se

Selenium

78.971

[Ar]3d¹⁰4s²4p⁴

9.7524

52

Te

Tellurium

127.60

[Kr]4d¹⁰5s²5p⁴

9.0097

84

Po

Polonium

(209)

[Hg]6p⁴

8.414

113

Nh

Nihonium

(286)

[Rn]5f¹⁴6d¹7s²

6.3676

114

Fl

Flerovium

(289)

[Rn]5f¹⁴6d²7s²

6.2817

115

Mc

Moscovium

(289)

[Rn]5f¹⁴6d³7s²

6.50

116

Lv

Livermorium

(293)

[Rn]5f¹⁴6d⁴7s²

6.58

117

Ts

Tennessine

(294)

[Rn]5f¹⁴6d⁵7s²

6.66

118

Og

Oganesson

(294)

[Rn]5f¹⁴6d⁶7s²

4.96

5

B

Boron

10.81

1s²2s²2p

5.9858

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Aluminum

26.982

[Ne]3s²3p

5.9858

14

Si

Silicon

28.085

[Ne]3s²3p²

8.1517

15

P

Phosphorus

30.974

[Ne]3s²3p³

10.4867

16

S

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32.06

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10.3600

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Cl

Chlorine

35.45

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Si

Silicon

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[

Atomic Number
Ground State
Symbol
Name
Standard Atomic Weight (Da)
Ground-state Configuration
Ionization Energy (eV)

58
Ce
Cerium
140.12
[Xe]4f¹5d¹6s²
5.5386

†Based upon ¹²C. () indicates the mass number of the longest-lived isotope.

NISTory of the Periodic Table

