



## COMMENTS BY THE OSAC LEGAL RESOURCE COMMITTEE (LRC)

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**TO:** Materials (Trace) Subcommittee of the Chemistry-Instrumental SAC

**FROM:** Lynn Garcia, LRC Liaison to Chemistry-Instrumental Analysis SAC

**RE:** **OSAC LEGAL RESOURCE COMMITTEE (LRC) COMMENTS ONE3085-17**

### Introduction

The Chemistry SAC has proposed the addition of the recently revised “Standard Guide for Fourier Transform Infrared Spectroscopy in Forensic Tape Examinations” (ASTM E3085-17) to the OSAC Registry of Approved Standards. On the basis of the information that has been provided to us, we believe that, with certain modifications, the standard can be included in the Registry of Approved Standards. Absent these modifications however, the LRC does not believe the standard guide is ready for the Registry.

### Guidelines on Ascertaining “Meaningful Differences” Are Missing

The standard defines a “meaningful difference” as “a feature or property of a sample that does not fall within the variation exhibited by the comparison sample, considering the limitations of the sample or technique, and therefore indicates the two samples do not share a common origin.” § 3.1.6. The standard adds that “[t]he use of this term does not imply the formal application of statistics.” § 3.1.6.1.

Our major concern is that the remainder of the standard offers no guidance on how to ascertain whether a difference is meaningful.<sup>1</sup>The standard states “Spectra cannot be distinguished if they contain no meaningful differences,” and then some examples are given.

The list of variables to consider (§ 8.5.1) is helpful, for it directs the analyst’s attention to the properties of the spectra that should be compared. But it is not clear what “variation exhibited by the comparison sample” (§ 3.1.6) means for these properties. Is there any variation exhibited by the comparison sample in “the presence or absence of absorption bands, their positions, shapes, and relative intensities”? Isn’t a band either present or absent? Whichever it is, there is no variation. Likewise, the position is where it is. The shape and relative intensity are what they are. The subsections do not describe the kinds of variations in presence, positions, shapes and intensities (either in the comparison sample itself or between the two samples being compared) that should be deemed “meaningful.”

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<sup>1</sup>We also note that the phrasing of § 3.1.6.1 is awkward—the use of the term “meaningful difference” does not imply the informal application of explicit statistics either, although it necessarily rests on statistical reasoning about variability. We suspect the sentence should be rephrased as follows: “Meaningful differences can be discerned without a quantitative analysis.” This observation is an editorial comment. If the sentence on statistical reasoning were the only item to be revised, it would not prevent approval of the standard.

It may be that the standard is intended to make these determinations entirely subjective and not governed by any explicit standards. If that is the recommendation or assumption, the document should say so, and it should identify the particular references that estimate the accuracy and reliability of these subjective judgments of “meaningful differences.”

## **Documentation**

We applaud the inclusion of Section 9, on documentation, in the standard. Consideration should be given to including a further section on reporting and testifying. If these matters are to be addressed in a separate standard—such as the *Standard Practice for Interpretation and Report Writing in Forensic Comparison of Trace Materials*—that fact should be mentioned.

Section 9.1 states that “[w]hen making comparisons of tape samples, the analyst’s assessment of the IR spectra shall be documented.” To provide guidance on what is required or recommended, this section should describe the type of information that should be in this documentation. For example, the analyst might be asked to annotate two spectra to show the differences that were considered.

Section 9.3 states that “[c]ase notes shall include a copy of the instrumental data that was used to reach a conclusion. All paper and electronic copies that are retained as part of the case file shall include a unique sample designation, the operator’s name or initials, and the date of analysis.” The word “includes” connotes that this list does not exhaust the necessary contents of the case notes, and one can infer from Section 9.1 that the documentation of the assessment of the spectra must be in the case notes, but this should be made explicit by stating that the case notes should also include the documentation of the assessment made by analyst on the spectra as well as all information necessary for an independent examiner to conduct a later analysis of the original analysis and the conclusions reached.

Section 9.4 states that “[a] description of the evidence analyzed by IR, the method of sample preparation, the analytical instrumentation used, mode of operation (transmission, ATR, etc.), and its operating parameters shall be included in the case notes or in the procedural manuals.” The case notes themselves should contain the operating parameters. At a minimum, they must include a notation that is information is available in the instrument manuals.

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