



Standard Practice for Describing and Measuring Performance of Ultraviolet and Visible Spectrophotometers¹

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INTRODUCTION

In developing a spectrophotometric method, it is the responsibility of the originator to describe the instrumentation and the performance required to duplicate the precision and accuracy of the method. It is necessary to specify this performance in terms that may be used by others in applications of the method.

The tests and measurements described in this practice are for the purpose of determining the experimental conditions required for a particular analytical method. In using this practice, an analyst has either a particular analysis for which he describes requirements for instrument performance or he expects to test the capability of an instrument to perform a particular analysis. To accomplish either of these objectives, it is necessary that instrument performance be obtained in terms of the factors that control the analysis. Unfortunately, it is true that not all the factors that can affect the results of an analysis are readily measured and easily specified for the various types of spectrophotometric equipment.

Of the many factors that control analytical results, this practice covers verification of the essential parameters of wavelength accuracy, photometric accuracy, stray light, resolution, and characteristics of absorption cells as the parameters of spectrophotometry that are likely to be affected by the analyst in obtaining data. Other important factors, particularly those primarily dependent on instrument design, are also covered in this practice.

1. Scope

1.1 This practice covers the description of requirements of spectrophotometric performance, especially for test methods, and the testing of the adequacy of available equipment for a specific method (for example, qualification for a given application). The tests give a measurement of some of the important parameters controlling results obtained in spectrophotometric methods, but it is specifically not to be concluded that all the factors in instrument performance are measured, or in fact may be required for a given application.

1.1.1 This practice is primarily directed to dispersive spectrophotometers used for transmittance measurements rather than instruments designed for diffuse transmission and diffuse reflection.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

[E131 Terminology Relating to Molecular Spectroscopy](#)

[E168 Practices for General Techniques of Infrared Quantitative Analysis](#)

[E169 Practices for General Techniques of Ultraviolet-Visible Quantitative Analysis](#)

¹ This practice is under the jurisdiction of ASTM Committee [E13](#) on Molecular Spectroscopy and Separation Science and is the direct responsibility of Subcommittee [E13.01](#) on Ultra-Violet, Visible, and Luminescence Spectroscopy.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.