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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Guide for Spectrochemical Laboratory Quality Assurance[1]

This standard is issued under the fixed designation E 743; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

ε1 NOTE—Section 11 was added editorially in January 1995.

1. Scope

1.1 This guide outlines the requirements for a system of quality assurance for the spectrochemical laboratory. It does not include a detailed description for setting up a quality assurance program.

1.2 *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 Document

2.1 *ASTM Standard:*

E 135 Terminology Relating to Analytical Chemistry for Metals, Ores, and Related Materials[2]

3. Terminology

3.1 *Descriptions of Terms Specific to This Standard:*

3.1.1 *audit*—an examination of the quality assurance system to determine adherence to documented procedures.

3.1.2 *certified test report*—an approved document, containing sufficient data and information to verify the results of required tests.

3.1.3 *documented*—recorded in proper format.

3.1.4 *quality assurance system*—a system of activities whose purpose is to provide assurance that the overall quality control program of a spectrochemical laboratory is in fact being carried out effectively.

3.1.5 *traceability*—the ability to relate an analytical result to a certified reference material.

3.1.6 For definitions of other terms used in this guide, refer to Terminology E 135.

4. Summary of Guide

4.1 This guide describes the essential features of quality assurance under the following headings: Terminology, Validity of Analytical Procedures, Calibration and Standardization, Sample Identification and Storage, Records Retention, and Internal Audit.

5. Significance and Use

5.1 In recent times there has been an increasing demand for quality assurance in most matters of human concern. Most spectrochemical laboratories are involved in evaluating manufactured goods, providing analytical services to the public, environmental monitoring, or a combination of these. Therefore, it is important to use a quality assurance program to ensure uniformity and highest quality performance.

6. Validity of Analytical Procedures

6.1 Fully validated and documented methods must be used for analyses that must be certified. Validation must be based upon reasonable results for accepted reference materials. The level of acceptance of results must be specified and based upon predetermined needs.

6.2 Whenever possible, routine methods of analysis should be based on standard methods (for example, ANSI, ASTM, AOAI, etc.) suitably adapted to specific materials, instrumentation, and analytical requirements. Written methods must be kept current and available to all laboratory personnel.

6.3 Qualifications for personnel are usually established by internal management personnel but may be regulated by external agencies. A comprehensive training program should be maintained to instruct all personnel on their responsibilities relative to the quality assurance system.

6.4 It is recommended that routine maintenance procedures for the analytical equipment be included along with analytical methods. Maintenance programs should include documented checks for adherence to design specifications, replacement of faulty equipment, and stability of instrumental outputs.

6.5 Procedures to monitor the precision and accuracy of the analytical methods should be established by those who audit the quality assurance system. These procedures should document traceability to suitable reference materials.

7. Calibration and Standardization

7.1 The instrument must be calibrated when installed, after major repairs are made, or as indicated by standardization checks.

7.2 The instrument should be standardized as frequently as performance experience indicates.

7.3 Determinations and interpretation of precision and accuracy are supervisory responsibilities.

7.4 Written procedures for calibration and standardization should be available.

[1] This guide is under the jurisdiction of ASTM Committee E-1 on Analytical Chemistry of Metals, Ores and Related Materials and is the direct responsibility of Subcommittee E01.22 on Statistics and Quality Control.

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[2] *Annual Book of ASTM Standards*, Vol 03.05.