



Standard Guide for Planning, Carrying Out, and Reporting Traceable Chemical Analyses of Metals, Ores, and Related Materials¹

This standard is issued under the fixed designation E 2053; 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.

1. Scope

1.1 This guide sets a protocol for generating and reporting measurements that are traceable to SI units or Certified Reference Materials in laboratories that serve the metals industries.

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 application of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

E 135 Standard Terminology Relating to Analytical Chemistry for Metals, Ores, and Related Materials²

2.2 Other Documents:

ISO/IEC 17025:1999—General Requirements for the Competence of Testing and Calibration Laboratories³

ISO Guide 30—Terms and Definitions Used in Connection with Reference Materials³

International Vocabulary of Basic and General Terms in Metrology [VIM]; ISO: 2nd ed., 1993³

3. Terminology

3.1 *Definitions*—Except as defined as follows, for definitions of terms used in this guide, refer to Terminology E 135.

3.2 *certified reference material*—reference material, accompanied by a certificate, one or more of whose property values are certified by a procedure which established its traceability to an accurate realization of the unit in which the property values are expressed, and for which each certified value is accompanied by an uncertainty at a stated level of confidence. (ISO Guide 30:1992)

3.3 *traceability*—property of the result of a measurement or the value of a standard whereby it can be related, with a stated uncertainty, to stated references, usually national or international standards, through an unbroken chain of comparisons. (ISO Guide 30:1992)

3.4 *Uncertainty (of measurement)*—parameter, associated with the result of a measurement, that characterizes the dispersion of values that could reasonably be attributed to the measured. (International Vocabulary of Basic and General Terms in Metrology [VIM] (ISO: 2nd ed., 1993)

3.5 *work plan*—a documented procedure intended for use by a laboratory to meet the measurement traceability requirements of a defined need.

4. Summary of Guide

4.1 A client shall prepare a request for traceable measurements and submit it to an ISO 17025 compliant laboratory for review and acceptance.

4.2 The laboratory shall prepare a work plan to meet the requirements and obtain concurrence with the client.

4.3 The laboratory shall make the measurements and issue a report.

5. Significance and Use

5.1 This guide establishes basic requirements which should be met by laboratories that generate and report test results that are traceable to SI units or to certified reference materials that are traceable to SI units. Traceability of chemical measurements is important because it provides a uniform basis for the comparison of results from different measurement systems and because it relates those results to our current knowledge of physical laws.

5.2 Many laboratories comply with ISO 17025 and participate in proficiency testing programs. Laboratories that are connected to the same accreditation bodies and proficiency test providers can be expected to report statistically similar results on the same sample. However, some test methods and some certified reference materials are not supported with data traceable to SI units. Therefore it is possible that fully compliant laboratories that are not connected to the same providers might report statistically different results if they used

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

Current edition approved Jan. 10, 2000. Published March 2000.

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

³ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

