



Standard Practice for Use of Terms Relating to the Development and Evaluation of Methods for Chemical Analysis¹

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INTRODUCTION

ASTM methods for determining the chemical composition of materials usually are developed in four stages: (1) experimental development of procedures and techniques, (2) translation of research into text suitable for analysts (in ASTM format), (3) demonstration of performance in an interlaboratory study (ILS), and (4) acceptance as a method published for use in laboratories. Details of the development processes may be complex, but the common concepts and terms needed to discuss them are relatively simple. The concepts must be carefully defined and terms selected to represent them unambiguously in the intended contexts.

A list of terms and definitions does not guarantee clear communication. Many terms have different common and technical meanings while representing different concepts when used in various contexts. The use of important terms and concepts in the context of methods of chemical analysis is illustrated by descriptions and by examples to help task group and subcommittee members communicate clearly.

1. Scope

1.1 This document covers terms and concepts used in developing and evaluating the performance of methods for determining chemical composition. Although useful with many types of methods, they are dealt with in this document in the context of chemical analysis of metals and related materials.

2. Referenced Documents

2.1 ASTM Standards:²

- E 135 Terminology Relating to Analytical Chemistry for Metals, Ores, and Related Materials
- E 1601 Practice for Conducting an Interlaboratory Study to Evaluate the Performance of an Analytical Method
- E 1763 Guide for Interpretation and Use of Results from Interlaboratory Testing of Chemical Analysis Methods

3. Terminology

3.1 Definitions Relating to Analytical Methods:

3.1.1 *accuracy, n—of methods of chemical analysis*, a characteristic manifested by agreement between average results and true analyte contents.

3.1.2 *analyte, n—in methods of chemical analysis*, the component determined by a method.

3.1.3 *matrix, n—in methods of chemical analysis*, all components in a material except the analyte.

3.1.4 *method, n—instructions used to produce a numerical result which are detailed in a document also referred to as “the method.”*

3.1.5 *precision, n—of methods of chemical analysis*, a characteristic manifested by agreement among individual results at a given analyte content.

3.1.6 *result, n—value representing the quantity of analyte that is obtained by applying a method one time to a test material.*

3.1.7 *sample, n—in methods of chemical analysis*, a portion of a material selected and processed to render its composition representative of the composition of the whole. (Contrast *specimen*.)

3.1.8 *specimen, n—in methods of chemical analysis*, a piece of material selected to be typical of the whole under the assumption that the whole is composed of pieces of similar composition. (Contrast *sample*.)

3.2 Definitions Referring to Statistics:

¹ This practice 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.

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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.