



Designation: E 1915 – 99

Standard Test Methods for Analysis of Metal Bearing Ores and Related Materials by Combustion Infrared Absorption Spectrometry¹

This standard is issued under the fixed designation E 1915; 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 test method covers the determination of total carbon and sulfur in metal bearing ores and related materials such as tailings and waste rock within the following ranges:

Analyte	Application Range, %	Quantitative Range, %
Total Carbon	0 to 10	0.1 to 10
Total Sulfur	0 to 8.8	0.1 to 8.8

1.2 The quantitative ranges for the partial decomposition test methods are dependent on the mineralogy of the samples being tested. The user of these test methods are advised to conduct an interlaboratory study in accordance with Practice E 1601 on the test methods selected for use at a particular mining site, in order to establish the quantitative ranges for these test methods on a site-specific basis.

1.3 The test methods appear in the following order:

	Sections
Carbon and Sulfur, Residual from Pyrolysis	12.7 — 12.12
Carbon and Sulfur, Total	12 — 12.6

1.4 The values stated in SI units are to be regarded as standard.

1.5 *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.* Specific warning statements are given in Section 7.

2. Referenced Documents

2.1 ASTM Standards:

D 1193 Specifications for Reagent Water²

E 29 Practice For Using Significant Digits in Test Data to Determine Conformance With Specifications³

E 50 Practices for Apparatus, Reagents and Safety Precautions for Chemical Analysis of Metals⁴

E 135 Terminology Relating to Analytical Chemistry for Metals, Ores, and Related Materials⁴

¹ This test method is under the jurisdiction of ASTM Committee E-1 on Analytical Chemistry for Metals, Ores, and Related Materials and is the direct responsibility of Subcommittee E01.02 on Ores, Concentrates, and Related Metallurgical Materials.

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² Annual Book of ASTM Standards, Vol 11.01.

³ Annual Book of ASTM Standards, Vol 14.02.

⁴ Annual Book of ASTM Standards, Vol 03.05.

E 882 Guide for Accountability and Quality Control in the Chemical Analysis of Metals⁵

E 1019 Test Methods for Determination of Carbon, Sulfur, Nitrogen, Oxygen and Hydrogen in Steel and in Iron, Nickel and Cobalt Alloys⁵

E 1601 Practice for Conducting an Interlaboratory Study to Evaluate the Performance of an Analytical Method⁵

E 1950 Practice for Reporting Results from Methods of Chemical Analysis⁵

3. Terminology

3.1 *Definitions*—For definitions of terms used in these test methods, refer to Terminology E 135.

4. Significance and Use

4.1 These test methods are primarily intended to test materials for compliance with compositional specifications and for monitoring. The determination of carbon and sulfur in ores and related materials is necessary to classify ores for metallurgical processing and to classify waste materials from the mining and processing of ores such as leach spoils, waste rock and tailings according to their potential to generate acid in the environment. This information is useful during mine development to assist in mining and mineral processing operations and proper disposal of waste materials.

4.2 These test methods also may be used for the classification of rock to be used in construction, where the potential to generate acid under environmental conditions exists.

4.3 It is assumed that the users of these test methods will be trained analysts capable of performing common laboratory procedures skillfully and safely. It is expected that work will be performed in a properly equipped laboratory and that proper waste disposal procedures will be followed. Appropriate quality control practices such as those described in Guide E 882 must be followed.

5. Apparatus

5.1 *Combustion-Infrared Spectrophotometer*, equipped with a combustion chamber, oxygen carrier stream and infrared absorption detector, suitable for analysis of sulfur in a minimum range instrument from 0.1 to 1.75 % or in a maximum range instrument from 0.1 to 8.8 % and carbon in the range of

⁵ Annual Book of ASTM Standards, Vol 03.06.