



Standard Test Methods for Chemical and Atomic Absorption Analysis of Uranium-Ore Concentrate¹

This standard is issued under the fixed designation C1022; 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—Sections 1.4 and 7.2 were editorially corrected in August 2010.

1. Scope

1.1 These test methods cover procedures for the chemical and atomic absorption analysis of uranium-ore concentrates to determine compliance with the requirements prescribed in Specification [C967](#).

1.2 The analytical procedures appear in the following order:

	Sections
Uranium by Ferrous Sulfate Reduction—Potassium Dichromate Titrimetry	9
Nitric Acid-Insoluble Uranium	10 to 18
Extractable Organic Material	19 to 26
Determination of Arsenic	27
Carbonate by CO ₂ Gravimetry	28 to 34
Fluoride by Ion-Selective Electrode	35 to 42
Halides by Volhard Titration	43 to 50
Moisture by Loss of Weight at 110°C	51 to 57
Phosphorus by Spectrophotometry	58 to 66
Determination of Silicon	67
Determination of Thorium	68
Calcium, Iron, Magnesium, Molybdenum, Titanium, and Vanadium by Atomic Absorption Spectrophotometry	69 to 78
Potassium and Sodium by Atomic Absorption Spectrophotometry	79 to 88
Boron by Spectrophotometry	89 to 98

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

1.4 *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 applica-*

bility of regulatory limitations prior to use. A specific precautionary statement is given in Section 7.

2. Referenced Documents

2.1 ASTM Standards:²

- [C761 Test Methods for Chemical, Mass Spectrometric, Spectrochemical, Nuclear, and Radiochemical Analysis of Uranium Hexafluoride](#)
- [C859 Terminology Relating to Nuclear Materials](#)
- [C967 Specification for Uranium Ore Concentrate](#)
- [C1110 Test Method for Determining Elements in Waste Streams by Inductively Coupled Plasma-Atomic Emission Spectroscopy \(Withdrawn 2014\)³](#)
- [C1219 Test Methods for Arsenic in Uranium Hexafluoride \(Withdrawn 2015\)³](#)
- [C1254 Test Method for Determination of Uranium in Mineral Acids by X-Ray Fluorescence](#)
- [C1267 Test Method for Uranium by Iron \(II\) Reduction in Phosphoric Acid Followed by Chromium \(VI\) Titration in the Presence of Vanadium](#)
- [C1287 Test Method for Determination of Impurities in Nuclear Grade Uranium Compounds by Inductively Coupled Plasma Mass Spectrometry](#)
- [C1347 Practice for Preparation and Dissolution of Uranium Materials for Analysis](#)
- [D1193 Specification for Reagent Water](#)
- [E60 Practice for Analysis of Metals, Ores, and Related Materials by Spectrophotometry](#)

¹ These test methods are under the jurisdiction of ASTM Committee [C26](#) on Nuclear Fuel Cycle and are the direct responsibility of Subcommittee [C26.05](#) on Methods of Test.

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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.

³ The last approved version of this historical standard is referenced on www.astm.org.