



Designation: D8404 – 21

Standard Practice for Preparation of Soil Samples by Ammonium Bifluoride-Nitric Acid Digestion for Subsequent Analysis for Metals and Metalloids¹

This standard is issued under the fixed designation D8404; 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 practice covers drying, homogenization, and ammonium bifluoride-nitric acid digestion of soil samples and associated quality control (QC) samples for the determination of metals and metalloids using laboratory atomic spectrometry analysis techniques such as inductively coupled plasma mass spectrometry (ICP-MS), inductively coupled plasma atomic emission spectrometry (ICP-AES), flame atomic absorption spectrometry (FAAS), and graphite furnace atomic absorption spectrometry (GFAAS). For ammonium bifluoride-nitric acid digestion of airborne dust and dust-wipe samples for the determination of metals and metalloids, see Practice D8344.

1.2 This practice is based on U.S. EPA SW 846, Test Method 3050, Test Method D7202, and Practice D8344.

1.3 This practice contains notes that are explanatory and are not part of the mandatory requirements of this standard.

1.4 The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

¹ This practice is under the jurisdiction of ASTM Committee D22 on Air Quality and is the direct responsibility of Subcommittee D22.04 on Workplace Air Quality. Current edition approved Sept. 1, 2021. Published October 2021. DOI: 10.1520/D8404-21.

2. Referenced Documents

2.1 ASTM Standards:²

- D653 Terminology Relating to Soil, Rock, and Contained Fluids
- D1129 Terminology Relating to Water
- D1193 Specification for Reagent Water
- D1356 Terminology Relating to Sampling and Analysis of Atmospheres
- D3974 Practices for Extraction of Trace Elements from Sediments
- D4840 Guide for Sample Chain-of-Custody Procedures
- D7202 Test Method for Determination of Beryllium in the Workplace by Extraction and Optical Fluorescence Detection
- D8344 Practice for Ammonium Bifluoride and Nitric Acid Digestion of Airborne Dust and Dust-Wipe Samples for the Determination of Metals and Metalloids
- E288 Specification for Laboratory Glass Volumetric Flasks
- E882 Guide for Accountability and Quality Control in the Chemical Analysis Laboratory
- E1154 Specification for Piston or Plunger Operated Volumetric Apparatus
- E1605 Terminology Relating to Lead in Buildings
- E1727 Practice for Field Collection of Soil Samples for Subsequent Lead Determination

2.2 U.S. Government Analytical Method:³

- U.S. EPA SW 846 Test Methods for Evaluating Solid Waste Physical/Chemical Methods

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 Available from United States Environmental Protection Agency (EPA), William Jefferson Clinton Bldg., 1200 Pennsylvania Ave., NW, Washington, DC 20460, <http://www.epa.gov>.