



Standard Test Methods for Analysis for Fluoride Content of the Atmosphere and Plant Tissues (Manual Procedures)^{1,2}

This standard is issued under the fixed designation D 3269; 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.

This standard has been approved for use by agencies of the Department of Defense.

^{ε1} NOTE—Footnotes were deleted editorially throughout in March 2001.

1. Scope

1.1 These test methods describe manual procedures for the determination of fluoride in various types of samples. The procedures outlined, consequently, are appropriate to the analysis of ambient air samples taken by diverse sampling techniques when properly applied.

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

1.3 *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 precautionary statements are given in 10.7.1.3 and Ref (9).

2. Referenced Documents

2.1 ASTM Standards:

D 1193 Specification for Reagent Water³

D 1356 Terminology Relating to Sampling and Analysis of Atmospheres⁴

D 1357 Practice for Planning the Sampling of the Ambient Atmosphere⁴

D 3267 Test Method for Separation and Collection of Particulate and Water-Soluble Fluorides in the Atmosphere

(Filter and Impinger Method)⁴

D 3268 Test Method for Separation and Collection of Particulate and Gaseous Fluorides in the Atmosphere (Sodium Bicarbonate-Coated Glass Tube and Particulate Filter Method)⁴

D 3270 Test Methods of Analysis for Fluoride Content of the Atmosphere and Plant Tissues (Semiautomated Method)⁴

E 1 Specification for ASTM Thermometers⁵

3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method, see Terminology D 1356.

4. Summary of Test Methods

4.1 Fundamentally, isolation of the fluoride followed by analysis constitutes each of the methods. Because of the wide range of types of samples and the care required in the analysis to provide a representative sample, reliable isolation of the fluoride, and accurate measurement, the methods are prefaced by discussion of general precautions and sample preparation as applied to specific cases.

5. Significance and Use

5.1 These test methods may be used for the determination of the fluoride content of particulate matter and gases collected in the atmosphere by passive and active monitors, including plant material. The user is warned that the fluoride content of passive collectors (including plant materials) gives a qualitative or semiquantitative measure of atmospheric concentrations or deposition rates of fluorides.

6. Apparatus

6.1 *Crucible, nickel, inconel, or platinum.*

6.2 *Beakers, nickel or platinum.*

6.3 *Muffle Furnace.*

6.4 *Wiley Cutting Mill.*

¹ These test methods are under the jurisdiction of ASTM Committee D22 on Sampling and Analysis of Atmospheres and are the direct responsibility of Subcommittee D22.03 on Ambient Atmospheres and Source Emissions.

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² These test methods were originally written by the Intersociety Committee on Methods for Ambient Air Sampling and Analysis and published as “Tentative Methods of Analysis for Fluoride Content of the Atmosphere and Plant Tissues (Manual Methods)” 12204-01-68T pp. 246–265, *Methods of Air Sampling and Analysis*, 1972, Parts A–F and 12202-01-72T, pp. 304–307, *Health Laboratory Science*, Vol 9, No. 4, October 1972. This revision has been adapted from “Methods of Air Sampling and Analysis,” Intersociety Committee, edited by James P. Lodge, Jr., 3rd Edition, Lewis Publishers, Inc., 1989, pp. 344–346 and 352–356. The methods are presented here essentially as published. The individuals participating in the Intersociety Committee work and the sources of the methods are referenced in the publications cited.

³ *Annual Book of ASTM Standards*, Vol 11.01

⁴ *Annual Book of ASTM Standards*, Vol 11.03.

⁵ *Annual Book of ASTM Standards*, Vol 14.03.

