



Designation: D1179 – 16 (Reapproved 2021)<sup>ε 1</sup>

## Standard Test Methods for Fluoride Ion in Water<sup>1</sup>

This standard is issued under the fixed designation D1179; 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 U.S. Department of Defense.*

ε<sup>1</sup> NOTE—The WTO caveat was added editorially in December 2021.

### 1. Scope

1.1 These test methods<sup>2</sup> cover the determination of fluoride ion in water. The following two test methods are given:

|                                       |                     |
|---------------------------------------|---------------------|
| Test Method A—Distillation            | Sections<br>7 to 13 |
| Test Method B—Ion Selective Electrode | 14 to 21            |

1.2 Test Method A covers the accurate measurement of total fluoride in water through isolation of the fluoride by distillation and subsequent measurement in the distillate by use of the ion selective electrode (ISE) method. The procedure covers the range from 0.1 to 2.6 mg/L of fluoride.

1.3 Test Method B covers the accurate measurement of simple fluoride ion in water by means of an ion selective electrode. With this test method, distillation is eliminated because the electrode is not affected by the interferences common to colorimetric procedures. Concentrations of fluoride from 0.1 to 1000 mg/L may be measured.

1.4 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this 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.* For a specific precautionary statement, see 12.1.2.

1.6 Former Test Method A, SPADNS Photometric Procedure, was discontinued. Refer to Appendix X1 for historical information.

1.7 *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.*

### 2. Referenced Documents

#### 2.1 ASTM Standards:<sup>3</sup>

D1066 Practice for Sampling Steam  
D1129 Terminology Relating to Water  
D1193 Specification for Reagent Water  
D2777 Practice for Determination of Precision and Bias of Applicable Test Methods of Committee D19 on Water  
D3370 Practices for Sampling Water from Flowing Process Streams  
D4127 Terminology Used with Ion-Selective Electrodes  
D5810 Guide for Spiking into Aqueous Samples  
D5847 Practice for Writing Quality Control Specifications for Standard Test Methods for Water Analysis

### 3. Terminology

#### 3.1 Definitions:

3.1.1 For definitions of terms used in this standard, refer to Terminologies D1129 and D4127.

### 4. Significance and Use

4.1 Simple and complex fluoride ions are found in natural waters. Fluoride forms complexing ions with silicon, aluminum, and boron. These complexes may originate from the use of fluorine compounds by industry.

4.2 Fluoridation of drinking water to prevent dental caries is practiced by a large number of communities in this country. Fluoride is monitored to assure that an optimum treatment level, usually near 1 mg/L, is maintained.

### 5. Purity of Reagents

5.1 Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall

<sup>1</sup> These test methods are under the jurisdiction of ASTM Committee D19 on Water and are the direct responsibility of Subcommittee D19.05 on Inorganic Constituents in Water.

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<sup>2</sup> Bellack, E., "Simplified Fluoride Distillation Method," *Journal of the American Water Works Association*, Vol 50, 1958, p. 530.

<sup>3</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.