



Standard Test Method for Strontium in Water¹

This standard is issued under the fixed designation D3920; 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 dissolved and total recoverable strontium in water and wastewater by atomic absorption spectroscopy.

1.2 The test method is applicable in the range from 0.1 to 1 mg/L of strontium. The range may be extended by dilution of the original sample.

1.3 Round-robin data were obtained in natural and reagent water matrices. It is the user's responsibility to ensure the validity of the test method for waters of untested matrices.

1.4 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system are mathematical conversions and may not be exact equivalents; therefore, each system shall be used independently of the other.

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 precautionary statements are given in and .*

2. Referenced Documents

2.1 *ASTM Standards:*²

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 Closed Conduits

D4691 Practice for Measuring Elements in Water by Flame Atomic Absorption Spectrophotometry

D4841 Practice for Estimation of Holding Time for Water Samples Containing Organic and Inorganic Constituents

¹ This test method is under the jurisdiction of ASTM Committee D19 on Water and is the direct responsibility of Subcommittee D19.05 on Inorganic Constituents in Water.

Current edition approved Sept. 1, 2012. Published September 2012. Originally approved in 1980. Last previous edition approved in 2002 as D3920 – 02(2007)E01. DOI: 10.1520/D3920-12

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. DOI: 10.1520/D3920-02R07E01.

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:* For definitions of terms used in this test method, refer to Terminology D1129.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *total recoverable strontium, n*—an arbitrary analytical term relating to the forms of strontium that are determinable by the digestion procedure described in this test method.

3.2.2 *laboratory control sample, n*—a solution with a certified concentration of the strontium.

4. Summary of Test Method

4.1 Strontium is determined by atomic absorption spectrophotometry. The sample is aspirated into an air-acetylene flame following the addition of lanthanum chloride/potassium chloride solution. Samples containing particulate matter that may clog the aspirator capillary or burner, thus producing inaccurate results, are filtered through a 0.45- μ m membrane filter prior to testing.

5. Significance and Use

5.1 Although most potable supplies contain little strontium, some well waters in the midwestern part of the United States have levels as high as 39 mg/L.³

5.2 This test method affords a reliable means of accurately determining strontium and correcting calcium results obtained by the methods cited in 6.2.

6. Interferences

6.1 Chemical interference caused by silicon, aluminum, and phosphate is controlled by adding lanthanum chloride. Potassium chloride is added to suppress the ionization of strontium.

NOTE 1—A nitrous oxide-acetylene flame has been used successfully by some to remove chemical interferences.

6.2 Strontium chemically resembles calcium and causes a positive error in gravimetric and titrimetric methods for calcium determination.

³ *Standard Method for the Examination of Water and Wastewater*, 14th Ed. American Public Health Assn., Washington, DC 20005.

*A Summary of Changes section appears at the end of this standard