



Standard Test Method for Measuring Anionic Contaminants in High-Purity Water by On-Line Ion Chromatography¹

This standard is issued under the fixed designation D5996; 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 on-line analysis of high-purity water by the ion chromatography technique. This test method is applicable for measuring various anionic contaminants in high-purity water, typically in the range of 0.01 to 100 $\mu\text{g/L}$. This test method is used to determine the concentration of acetate, formate, chloride, fluoride, phosphate, nitrate, and sulfate in a continuously flowing sample. The range of the test method is only as good as the reagent water available for preparing standards. At extremely low concentrations, <1.0 $\mu\text{g/L}$, preparing standards is difficult, and extra care must be taken in their preparation. The sample may have to be conditioned from higher pressures and temperatures to conditions that are suitable for use by on-line instruments.

1.2 Online sample analysis of flowing streams does not lend itself to collaborative studies due to the nature of the sample and the possibility of contamination that may result from handling the sample as part of the collaborative study. Therefore this standard test method is not based on the results of a collaborative study but is intended to provide the best possible guidance for doing this type of analysis.

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 applicability of regulatory limitations prior to use.*

¹ This test method is under the jurisdiction of ASTM Committee D19 on Water and is the direct responsibility of Subcommittee D19.03 on Sampling Water and Water-Formed Deposits, Analysis of Water for Power Generation and Process Use, On-Line Water Analysis, and Surveillance of Water.

Current edition approved Feb. 15, 2016. Published June 2016. Originally approved in 1996. Last previous edition approved in 2009 as D5996 – 05 (2009). DOI: 10.1520/D5996-16.

2. Referenced Documents

2.1 ASTM Standards:²

- D1066 Practice for Sampling Steam
- D1129 Terminology Relating to Water
- D1192 Guide for Equipment for Sampling Water and Steam in Closed Conduits (Withdrawn 2003)³
- 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
- D3864 Guide for On-Line Monitoring Systems for Water Analysis
- D4453 Practice for Handling of High Purity Water Samples
- D5542 Test Methods for Trace Anions in High Purity Water by Ion Chromatography
- 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 Terminology D1129.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *analytical column, n*—a column used to separate the anions of interest.

3.2.2 *analytical column set, n*—a combination of one or more guard columns followed by one or more analytical columns.

3.2.3 *anion suppressor device, n*—a device that is placed between the analytical columns and the detector.

3.2.3.1 *Discussion*—Its purpose is to inhibit detector response to the ionic constituents in the eluant, so as to lower the

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.