



Designation: D8234 – 19

Standard Test Method for Anions in High Ionic Water by Ion Chromatography using Tandem Suppressed Conductivity and UV Detection¹

This standard is issued under the fixed designation D8234; 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 simultaneous determination of fluoride (F^-), nitrite-N (NO_2-N), *ortho*-phosphate-P ($o-PO_4-P$), bromide (Br^-), nitrate-N (NO_3-N), and sulfate (SO_4^{-2}) ions in high saline water (up to 20 % sodium chloride (NaCl)) by suppressed ion chromatography and tandem ultra-violet (UV) detection.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.2.1 *Exception*—The inch-pound and SI units shown for pressure measurements are to be individually regarded as 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *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:*²

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

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.

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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.

D3370 Practices for Sampling Water from Flowing Process Streams

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.

4. Summary of Test Method

4.1 This test method measures NO_2-N , NO_3-N , and Br^- in presence of high level concentrations of chloride ion.

5. Significance and Use

5.1 Ion chromatography provides for both qualitative and quantitative determination of common anions, F^- , NO_2^- , hydrogen phosphate ion (HPO_4^{-2}), Br^- , NO_3^- , and SO_4^{-2} , in the milligram per litre range from a single analytical operation requiring only a few millilitres of sample for analysis.

5.2 Anion combinations such as chloride/bromide (Cl^-/Br^-) and nitrite/nitrate (NO_2^-/NO_3^-), which may be difficult to distinguish by other analytical methods, are readily separated by ion chromatography.

6. Interferences

6.1 Since chloride and nitrite elute very close together, they potentially interfere for each other. Low molecular weight organic acid may interfere with fluoride ion. Selection of proper analytical column will permit resolution of these interfering compounds from fluoride ion.

6.2 As with other types of chromatography, if one of the sample components is present at very high levels, it may interfere by causing a very large peak on the chromatogram that could mask other peaks present. This type of interference is normally minimized by dilution of the sample and in some instances may be corrected if the concentration of that anion is of interest. However, care should be taken not to dilute the analyte concentration below its detectable limit. Use of the UV detector enables detection of nitrite nitrogen in presence of high concentrations of chloride ion.