



Standard Test Method for Chloride Ions in Brackish Water, Seawater, and Brines¹

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1. Scope

1.1 This test method² is applicable to the measurement of chloride in highly mineralized waters such as oil field brines, seawater, and brackish water. The test method is based upon the titration of chloride with silver nitrate, using a visual indicator.

1.2 Samples containing from 10 to 150 mg of chloride can be analyzed by this test method. These levels are achieved by dilution as described in the test method.

1.3 It is the user's responsibility to assure the validity of the method for untested types of water.

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.*

2. Referenced Documents

2.1 ASTM Standards:

D 1129 Terminology Relating to Water³

D 1193 Specification for Reagent Water³

D 2777 Practice for Determination of Precision and Bias of Applicable Methods of Committee D-19 on Water³

D 3370 Practices for Sampling Water from Closed Conduits³

3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method, refer to Terminology D 1129.

4. Summary of Test Method

4.1 This test method is based upon the Mohr procedure for determining chloride ion with silver nitrate. The chloride reacts with the silver ion before any silver chromate forms, due to the lower solubility of silver chloride. The potassium chromate indicator reacts with excess silver ion to form a red silver

chromate precipitate. The end point is the appearance of the first permanent orange color.

4.2 This test method is suitable for analyzing solutions with a pH between 6.0 and 8.5.

5. Significance and Use

5.1 Chloride is present in virtually all oil field brines, seawaters, and many waste waters. Identification of the origin of the water and selection of its disposal method may be based upon the chloride content. The chloride content is also used to estimate the resistivity of formation waters and to differentiate between subsurface formations.

6. Interferences

6.1 Sulfide, bromide, iodide, thiocyanate, cyanide, phosphate, sulfite, carbonate, hydroxide, and iron interfere in this test method. Sulfide, sulfite, and thiosulfate can be removed with a peroxide treatment, but usually no attempt is made to remove bromide and iodide because they are usually present in insignificant quantities compared to chloride. If necessary, the pH can be raised and the hydroxides of several metals, including iron, can be filtered off. Iron, barium, lead, and bismuth precipitate with the chromate indicator.

7. Apparatus

7.1 *Laboratory Glassware.*

7.2 *Buret, 25-mL capacity.*

7.3 *Hotplate.*

7.4 *Magnetic Stirrer and TFE-fluorocarbon-Coated Stirring Bars.*

8. Reagents

8.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specification of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available.⁴ Other grades may be used, provided it is first ascertained that the reagent is of

¹ This test method is under the jurisdiction of ASTM Committee D-19 on Water and is the direct responsibility of Subcommittee D19.05 on Inorganic Constituents in Water.

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² Hillebrand, W. F., Lundell, G. E. F., Bright, H. A., and Hoffman, J. I., *Applied Inorganic Analysis*, 2nd Ed., 732, John Wiley & Sons, Inc., New York, NY, 1953.

³ *Annual Book of ASTM Standards*, Vol 11.01.

⁴ *Reagent Chemicals, American Chemical Society Specifications*, American Chemical Society, Washington, DC. For suggestions on the testing of reagents not listed by the American Chemical Society, see *Analar Standards for Laboratory Chemicals*, BDH Ltd., Poole, Dorset, U.K., and the *United States Pharmacopoeia and National Formulary*, U.S. Pharmaceutical Convention, Inc. (USPC), Rockville, MD.