



Standard Test Method for Anions in Caustic Soda and Caustic Potash (Sodium Hydroxide and Potassium Hydroxide) by Ion Chromatography¹

This standard is issued under the fixed designation E1787; 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 anionic impurities in 50 % caustic soda (sodium hydroxide) and 50 % caustic potash (potassium hydroxide) solutions using ion chromatography (IC). Anions that can be determined at concentrations of approximately 0.1 to 1000 µg/g (ppm) include: bromide, chlorate, chloride, fluoride, nitrate, phosphate, and sulfate.

1.2 By varying the sample size, this test method can be used for anhydrous caustic soda and caustic potash products, as well as other concentrations of liquid products.

1.3 This test method is not intended to be used to quantify chloride in caustic soda where the sodium chloride concentration is approximately 1 %. For the most accurate determinations, it is recommended that high concentrations of chloride be analyzed using a potentiometric titration procedure, such as the one described in Test Methods E291.

1.4 The values stated in SI units are to be regarded as standard. The values given in parentheses are for information only.

1.5 Review the current appropriate Safety Data Sheets (SDS) for detailed information concerning toxicity, first aid procedures, and safety precautions.

1.6 *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 hazards statements are given in Section 8.

¹ This test method is under the jurisdiction of ASTM Committee D16 on Aromatic Hydrocarbons and Related Chemicals and is the direct responsibility of Subcommittee D16.15 on Industrial and Specialty General Standards.

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2. Referenced Documents

2.1 ASTM Standards:²

D1193 Specification for Reagent Water

E180 Practice for Determining the Precision of ASTM Methods for Analysis and Testing of Industrial and Specialty Chemicals (Withdrawn 2009)³

E291 Test Methods for Chemical Analysis of Caustic Soda and Caustic Potash (Sodium Hydroxide and Potassium Hydroxide)

3. Summary of Test Method

3.1 Bromide, chlorate, chloride, fluoride, nitrate, phosphate and sulfate are measured in NaOH or KOH by ion chromatography. The sample solution is diluted and injected onto a sample loop of an automated neutralization module. The sample in the loop is pumped to a suppressor device (electrolytically or chemically regenerated) to neutralize the hydroxide ions. Anionic constituents of the neutralized sample are concentrated on an anion concentrator column. After the concentration they are separated into individual elution bands in the eluent on a separator column. The conductivity of the eluent is reduced with an anion suppression device, and the anions of interest are detected using a conductivity detector. Quantitation of the anions in the sample solution is achieved by calibrating the IC with a series of standards containing known amounts of the anions. These standards are also passed through the neutralization device.

4. Significance and Use

4.1 Anion impurities in caustic soda and caustic potash are monitored by manufacturers and users for quality control of 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.