



Standard Test Method for Chloride in Mono-, Di- and Tri-ethylene Glycol by Ion Chromatography¹

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1. Scope*

1.1 This test method covers the determination of inorganic chloride (chloride ion) in monoethylene glycol (MEG), diethylene glycol (DEG) and triethylene glycol (TEG) in the range of 0.01 to 1.0 mg/kg by ion chromatography (IC).

1.2 Ethylene glycol can be analyzed directly by this test method without any sample preparation or diluted with high quality deionized water if an autosampler is used and dilution is necessary (that is, 50:50 or other suitable ratio).

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

1.3.1 The exception is the additional information of (psi) in 9.3.3, 11.1.1, and 11.2.1.

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

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 to determine the applicability of regulatory limitations prior to use.* For specific hazard statements, see Section 9.

2. Referenced Documents

2.1 *ASTM Standards:*²

D1193 Specification for Reagent Water

D6299 Practice for Applying Statistical Quality Assurance and Control Charting Techniques to Evaluate Analytical Measurement System Performance

E180 Practice for Determining the Precision of ASTM

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 D16.16 on Industrial and Specialty Product Standards.

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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.

Methods for Analysis and Testing of Industrial and Specialty Chemicals (Withdrawn 2009)³

E300 Practice for Sampling Industrial Chemicals

3. Summary of Test Method

3.1 An aliquot of the glycol sample is injected directly (manually) or diluted (via autosampler) into an ion chromatograph consisting of an injector with a fixed sample loop, two anion exchange columns (guard and separator column), an anion suppressor and a conductivity detector. Ions are separated based on their affinity for the ion exchange sites of the resin with respect to the resin's affinity for the eluent. The suppressor increases the sensitivity of the test method by both increasing the conductivity of the analytes and decreasing the conductivity of the eluent. The suppressor converts the eluent and the analytes to the corresponding hydrogen form acids. The chloride is detected by conductivity detection and identified by retention time. Quantitation is by peak area using an external standard calibration curve. Instructions are provided for two equivalent IC systems.

4. Significance and Use

4.1 This test method provides for the quantitative determination of inorganic chloride (chloride ion) in monoethylene glycol (MEG), diethylene glycol (DEG) and triethylene glycol (TEG) using ion chromatography with conductivity detection. The analysis time is less than 5 min with little or no sample preparation required. Conductivity detection is a universal detection mode and is linear over the range of the method. Acceptable levels of chloride in polyester-grade and low-conductivity-grade MEG vary with the manufacturer's specifications but are normally in the low mg/kg range. Knowledge of the chloride content in polyester-grade and low-conductivity-grade MEG is required to establish whether the MEG product meets specification requirements.

4.2 Glycols have high viscosities and a dilution with high quality deionized water may be required depending on the capability of the autosampler, if used, to deliver the injection.

³ The last approved version of this historical standard is referenced on www.astm.org.

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