



Standard Test Method for Acidity in Mono-, Di-, Tri- and Tetraethylene Glycol by Non-Aqueous Potentiometric Titration¹

This standard is issued under the fixed designation E2679; 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.

^{ε1} NOTE—Minor editorial changes were made in February 2016.

1. Scope

1.1 This test method covers the determination of total acidity as acetic acid in commonly available grades of monoethylene glycol, diethylene glycol, triethylene glycol and tetraethylene glycol using a non-aqueous potentiometric titration. This test method is useful for determining low levels of acidity, below 200 mg/kg.

1.2 The mono-, di-, tri- and tetraethylene glycols can be analyzed directly by this test method without any sample preparation.

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

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

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 determine the applicability of regulatory limitations prior to use.* Specific hazards statements are given in the section on Hazards, Section 9.

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Practice for Determining the Precision of ASTM Methods for Analysis and Testing of Industrial and Specialty Chemicals (Withdrawn 2009)³

3. Terminology

3.1 Definitions:

3.1.1 *acidity*—the amount of total acid titrated with an aqueous base (KOH or NaOH) in a sample of ethylene glycol. The acidity is calculated as acetic acid in mg/kg.

4. Summary of Test Method

4.1 An aliquot of a mono-, di-, tri- or tetraethylene glycol sample is weighed and titrated potentiometrically with a monotonic or dynamic mode of titrant addition using an aqueous base (NaOH or KOH) solution to determine the acid content in milligrams of acid as acetic acid per kilogram of sample. An ethylene glycol sample can be analyzed directly by this test method without any sample preparation using a combination pH electrode with an inert ethanol electrolyte designed for non-aqueous titrations. The potentiometric titration readings in millivolts are plotted automatically against the respective volumes of the titrating solution and the end point is identified by a well-defined inflection in the resulting curve.

5. Significance and Use

5.1 This test method provides for the quantitative determination of total acidity in ethylene glycols by non-aqueous potentiometric titration. The run time for titration of ethylene glycol samples ranges from 5 to 10 min with no sample preparation required. The length of time for a titration depends on the amount of acidity in the sample and the acidity generally increases from monoethylene glycol to the higher glycols like tetraethylene glycol.

5.2 Acceptable levels of acidity in ethylene glycols vary with the manufacturer's specifications but are normally below 200 mg/kg. Knowledge of the acidity in ethylene glycols is required to establish whether the product quality meets specification requirements.

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.

Current edition approved Jan. 1, 2016. Published February 2016. Originally approved in 2009. Last previous edition approved in 2009 as E2679– 09. DOI: 10.1520/E2679-09R16E01.

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.