



Standard Test Method for Hydroxyl Groups Using Reaction with *p*-Toluenesulfonyl Isocyanate (TSI) and Potentiometric Titration with Tetrabutylammonium Hydroxide¹

This standard is issued under the fixed designation E1899; 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 hydroxyl groups attached to primary and secondary carbon atoms in aliphatic and cyclic compounds and phenols. It is not suitable for determination of hydroxyl groups attached to tertiary carbon atoms. This test method is applicable to polyacetals, temperature sensitive materials, high solids polymer polyols, and rigid polyols. Other available test methods listed in [Note 1](#) are not suitable for many of the sample types listed above.

1.1.1 This test method is currently recommended for neutral refined products. Successful application has been made, however, to some in-process samples that contain an excess of acidic species. Proper validation must be performed, of course, to show that the acidic species either does not interfere, or that the acidic species interference has been obviated.

NOTE 1—Other methods for determination of hydroxyl groups are given in Test Methods [D817](#), [D871](#), [D1957](#), [D2195](#), [D4252](#), [D4273](#), [D4274](#), [E222](#), [E326](#), and [E335](#).

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

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

1.4 *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.* For specific hazards see Section [9](#).

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.

Current edition approved April 1, 2016. Published May 2016. Originally approved in 1997. Last previous edition approved in 2008 as E1899 – 08. DOI: 10.1520/E1899-16.

2. Referenced Documents

2.1 ASTM Standards:²

[D817 Test Methods of Testing Cellulose Acetate Propionate and Cellulose Acetate Butyrate](#)

[D871 Test Methods of Testing Cellulose Acetate](#)

[D1193 Specification for Reagent Water](#)

[D1957 Test Method for Hydroxyl Value of Fatty Oils and Acids](#) (Withdrawn 2007)³

[D2195 Test Methods for Pentaerythritol](#) (Withdrawn 2011)³

[D4252 Test Methods for Chemical Analysis of Alcohol Ethoxylates and Alkylphenol Ethoxylates](#)

[D4273 Test Method for Polyurethane Raw Materials: Determination of Primary Hydroxyl Content of Polyether Polyols](#)

[D4274 Test Methods for Testing Polyurethane Raw Materials: Determination of Hydroxyl Numbers of Polyols](#)

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

[E222 Test Methods for Hydroxyl Groups Using Acetic Anhydride Acetylation](#)

[E300 Practice for Sampling Industrial Chemicals](#)

[E326 Test Method for Hydroxyl Groups by Phthalic Anhydride Esterification](#) (Discontinued 2001) (Withdrawn 2001)³

[E335 Test Method for Hydroxyl Groups by Pyromellitic Dianhydride Esterification](#) (Withdrawn 2002)³

3. Terminology

3.1 Definitions:

3.1.1 *hydroxyl number (OH#)*—the milligrams of potassium hydroxide equivalent to the hydroxyl content of 1 g of sample.

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.