



Standard Test Method for Total Acid Acceptance of Halogenated Organic Solvents (Nonreflux Methods)¹

This standard is issued under the fixed designation D 2942; 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 the total acid acceptance including amine and neutral type (alpha epoxide) stabilizers in halogenated organic solvents.

1.2 *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 precautionary statements are given in Section 7.

2. Referenced Documents

2.1 ASTM Standards:

D 1193 Specification for Reagent Water²

D 2106 Test Method for the Determination of Amine Acid Acceptance (Alkalinity) of Halogenated Organic Solvents³

E 200 Practice for Preparation, Standardization, and Storage of Standard and Reagent Solutions for Chemical Analysis³

3. Summary of Test Method

3.1 The total acid acceptance is determined by the reaction of the sample with a known amount of hydrochloric acid that has been dissolved in isopropyl alcohol. The excess acid remaining after the reaction with the acid acceptor stabilizes is then back-titrated with a standardized solution of sodium hydroxide. The total acid acceptance of the stabilizers can be calculated and reported as weight % NaOH.

4. Significance and Use

4.1 Solvents that have been depleted in stabilizer content can become acidic. Acids can cause corrosion to process and storage equipment used for halogenated solvents.

4.2 Halogenated organic solvents may contain amine type (alkaline, aqueous extractable) acid accepting additives, neutral type (typically epoxide) acid accepting additives or both. This test method can determine the combined acid acceptance from

both types of stabilizers. In addition, if the amine acid acceptance is determined by a separate procedure (See Test Method D 2106), the amount of neutral acid accepting stabilizers in a solvent can be calculated from the difference between combined and amine acid acceptance values.

4.3 This test method may be used by producers and users to verify that a product is complying with acid acceptance product specifications or by users to monitor the acid accepting ability of a solvent in use.

5. Apparatus

5.1 *Iodine or Erlenmeyer Flasks* 250-mL, with ground-glass stoppers.

5.2 *Burets*, 25-mL or 50-mL, graduated to 0.1 mL.

5.3 *Pipet*, 10-mL and 25-mL.

6. Reagents

6.1 *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 specifications 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 sufficiently high purity to permit its use without lessening the accuracy of the determination.

6.2 *Purity of Water*—Unless otherwise indicated, references to water shall be understood to mean reagent water conforming to Specification D 1193.

6.3 *Bromophenol Blue Indicator Solution* (1.0 g/L)—Prepared by dissolving 1.0 g of bromophenol blue in a mixture of 800 mL of water and 200 mL of denatured ethyl alcohol. The pH range is 3.0 to 4.6. The color change is from yellow on the acid side to blue-green on the alkaline side.

6.4 *Hydrochlorination Reagent* (0.1 N HCl)—Prepare by dissolving 4.4 mL of concentrated hydrochloric acid (sp gr 1.19) in isopropyl alcohol and diluting to 500 mL with alcohol.

6.5 *Sodium Hydroxide, Standard Solution* (0.1 N)—Prepare and standardize in accordance with Practice E 200.

¹ This test method is under the jurisdiction of ASTM Committee D-26 on Halogenated Organic Solvents and Fire Extinguishing Agents and is the direct responsibility of Subcommittee D26.04 on Test Methods.

Current edition approved Dec. 10, 1996. Published June 1997. Originally published as D 2942 – 71 T. Last previous edition D 2942 – 92.

² *Annual Book of ASTM Standards*, Vol 11.01.

³ *Annual Book of ASTM Standards*, Vol 15.05.

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 Pharmacopeia and National Formulary*, U.S. Pharmacopeial Convention, Inc. (USPC), Rockville, MD.