



Designation: D 1613 – 96 (Reapproved 1999)

Standard Test Method for Acidity in Volatile Solvents and Chemical Intermediates Used in Paint, Varnish, Lacquer, and Related Products¹

This standard is issued under the fixed designation D 1613; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This test method covers the determination of total acidity as acetic acid, in concentrations below 0.05 %, in organic compounds and hydrocarbon mixtures used in paint, varnish, and lacquer solvents and diluents. It is known to be applicable to such mixtures as low molecular weight saturated and unsaturated alcohols, ketones, ethers, esters, hydrocarbon diluents, naphtha, and other light distillate petroleum fractions.

1.2 *This standard does not purport to address the safety concerns, if any, associated with its use. It is the responsibility of whoever uses this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

1.3 For specific hazard information and guidance consult supplier's Material Safety Data Sheet.

2. Referenced Documents

2.1 *ASTM Standards:*

D 770 Specification for Isopropyl Alcohol²

D 1193 Specification for Reagent Water³

E 200 Practice for Preparation, Standardization, and Storage of Standard and Reagent Solutions for Chemical Analysis⁴

3. Summary of Test Method

3.1 The specimen is mixed with either an equal volume of water or an equal volume of alcohol, and titrated with aqueous sodium hydroxide solution to the phenolphthalein end point.

4. Significance and Use

4.1 This test method is useful for determining low levels of acidity, below 0.05 %, in organic compounds and hydrocarbon mixtures. The total acidity is calculated as acetic acid or milligrams of sodium hydroxide per gram of sample.

4.2 Acidity may be present as a result of contamination,

decomposition during storage or distribution, or manufacture. This test method may be used in assessing compliance with a specification.

5. Apparatus

5.1 *Buret*, 10-mL, graduated in 0.05-mL subdivisions.

5.2 *Erlenmeyer Flask*, 250-mL capacity.

6. Purity of Reagents

6.1 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.⁵ 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 Unless otherwise indicated, references to water shall be understood to mean reagent water conforming to Type IV of Specification D 1193.

7. Reagents

7.1 *Alcohols*, refined, ethyl or isopropyl.

NOTE 1—Isopropyl alcohol (99 % grade) conforming to Specification D 770, or 190 proof ethyl alcohol conforming to formula No. 3A of the U.S. Bureau of Internal Revenue is suitable for use as the solvent. The use of methyl alcohol is not recommended.

7.2 *Phenolphthalein Indicator Solution*, (10 g/L)—Dissolve 1 g of phenolphthalein in ethyl or isopropyl alcohol (see Note 1) and dilute to 100 mL with the alcohol.

7.3 *Sodium Hydroxide, Standard Solution* (0.05 N)—Prepare and standardize a 0.05 N sodium hydroxide (NaOH) solution (Note 2) in accordance with Sections 12 to 17 of Practice E 200.

NOTE 2—Alternatively, KOH solution may be used.

¹ This test method is under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.35 on Solvents, Plasticizers, and Chemical Intermediates.

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² *Annual Book of ASTM Standards*, Vol 06.04.

³ *Annual Book of ASTM Standards*, Vol 11.01.

⁴ *Annual Book of ASTM Standards*, Vol 15.05.

⁵ *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 Pharmacopoeia and National Formulary*, U.S. Pharmacopoeial Convention, Inc. (USPC), Rockville, MD.