



Standard Test Method for Total Acidity of Organic Acids¹

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1. Scope

1.1 This test method covers the determination of assay of carboxylic acids by total acidity. The method is suitable for assaying acids which are soluble in water or isopropanol and have purities between 50 and 100 % calculated on the basis of the major component.

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 8.*

2. Referenced Documents

2.1 ASTM Standards:

D 1193 Specification for Reagent Water²

E 180 Practice for Determining the Precision of ASTM Methods for Analysis and Testing of Industrial Chemicals³

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

3. Terminology

3.1 There are no terms in this test method that require new or other than dictionary definitions.

4. Summary of Test Method

4.1 This test method employs the titration of the acid dissolved in water or isopropanol with standard aqueous sodium hydroxide solution. The color change of phenolphthalein is used as the end-point indicator.

5. Significance and Use

5.1 This test method provides a method of measurement of assay (relative purity) of single component organic acids that are soluble in water or isopropyl alcohol. Acids and acid solutions are used in many chemical processes. The relative concentration of acids affects the efficiency of these processes.

This test method provides a test procedure for specification acceptance and manufacturing control.

6. Interferences

6.1 Carbon dioxide interferes quantitatively and should be excluded from the titration. Other materials acidic to phenolphthalein present as impurities in the sample also interfere quantitatively. Usually no correction for these is made.

7. Apparatus

7.1 *Buret*—A calibrated 100-mL buret with a 50 or 75-mL reservoir on top of a lower portion calibrated in 0.1-mL divisions and equipped with TFE-fluorocarbon stopcock plug is suitable.

8. Reagents and Materials

8.1 *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.

8.2 *Purity of Water*—Unless otherwise indicated, references to water shall be understood to mean as defined by Type II or Type III of Specification D 1193.

8.3 *Isopropanol, Neutralized*—Add 2 mL of phenolphthalein indicator solution to 1 L of 99 % isopropanol and make faintly pink by the dropwise addition of NaOH solution.

8.4 *Phenolphthalein Indicator Solution* (10 g/L)—Prepare in accordance with Practice E 200.

8.5 *Sodium Hydroxide Standard Solution* (0.5 N)—Prepare and standardize a 0.5 N solution of sodium hydroxide (NaOH) in accordance with Practice E 200. Determine and record the temperature at which the standardization was performed. The normality of this solution shall be corrected to the temperature at which the determination is performed as follows:

$$N_2 = N_1 - 0.00014 (t_2 - t_1) \quad (1)$$

¹ This test method is under the jurisdiction of ASTM Committee E15 on Industrial and Specialty Chemicals and is the direct responsibility of Subcommittee E15.01 on General Standards.

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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. Pharmaceutical Convention, Inc. (USPC), Rockville, MD.