



Designation: E 1788 – 96

Standard Test Method for Acidity in Acrylonitrile¹

This standard is issued under the fixed designation E 1788; 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 total acidity as acetic acid in concentrations below 500 ppm in acrylonitrile.

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 hazard statements are given in Section 8.

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

2. Referenced Documents

2.1 *ASTM Standards:*

D 1193 Specification for Reagent Water²

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

3. Summary of Test Method

3.1 The acrylonitrile sample is titrated with alcoholic sodium hydroxide solution to the visual end point.

4. Significance and Use

4.1 This test method is useful for determining low levels of acidity, below 500 ppm in acrylonitrile. The total acidity is calculated as acetic acid.

4.2 Acidity may be present as a result of contamination or decomposition during storage, distribution, or manufacture.

5. Apparatus

5.1 *Buret*, 10 mL, graduated in 0.05 mL subdivision.

6. Purity of Reagents

6.1 Use reagent grade chemicals in all tests. Unless otherwise indicated, 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 Unless otherwise indicated, references to water mean reagent water conforming to Type II or Type III of Specification D 1193.

7. Reagents

7.1 *Bromthymol Blue Indicator Solution* (1 g/L)—Weigh 100 mg into a 150 mL beaker, add 1.5 mL of 0.1 N NaOH to aid in dissolving, gradually add 100 mL of methanol. Neutralize to a deep green by dropwise addition of 0.02 N NaOH.

7.2 *Sodium Hydroxide Standard Solution* (0.02 N)—Dissolve 0.800 g NaOH in 500 mL of methanol and dilute to 1 L with methanol. Standardize in accordance with the appropriate sections of Test Method E 200.

8. Hazards

8.1 Acrylonitrile is potentially hazardous to human health if not properly handled. Acrylonitrile is a suspected human carcinogen. Use acrylonitrile in a well ventilated hood.

8.2 Acrylonitrile can contribute to a toxic condition in systems of the human body from inhalation, swallowing, or contact with the eyes or skin. Direct contact with acrylonitrile can cause skin burns.

8.3 Acrylonitrile liquid and vapor are absorbed readily into shoe leather and clothing and will penetrate most rubbers, barrier fabrics, or creams. Contact lenses should not be worn in areas where eye contact with acrylonitrile could occur. Impermeable protective clothing must be used. Consult the current MSDS for recommended materials.

9. Procedure

9.1 To a 250-mL Erlenmeyer flask, add 0.5 mL of bromthymol blue indicator solution.

9.2 Pipet 100 mL of the sample into the 250-mL Erlenmeyer flask. Titrate with the 0.02 N NaOH solution to the first perceptible blue color.

¹ This test method is under the jurisdiction of ASTM Committee E15 on Industrial and Specialty Chemicals and is the direct responsibility of Subcommittee E15.02 on Product 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. Pharmacopeial Convention, Inc. (USPC), Rockville, MD.