



Standard Test Methods for Analysis of Acrylonitrile¹

This standard is issued under the fixed designation E 1178; 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 These test methods cover the analysis of acrylonitrile.
- 1.2 The analytical procedures appear in the following order:

	Sections
Color	7 to 9
Hydrogen Cyanide	10 to 18
p-Methoxyphenol	19 to 28
Water	29 to 32

1.3 *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.* See Section 5 for specific hazards statements.

1.4 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
- D 1209 Test Method for Color of Clear Liquids (Platinum-Cobalt Scale)³
- E 60 Practice for Analysis of Metals, Ores, and Related Materials by Molecular Absorption Spectrometry⁴
- E 180 Practice for Determining Precision of ASTM Methods for Analysis and Testing of Industrial Chemicals⁵
- E 200 Practice for Preparation, Standardization, and Storage of Standard and Reagent Solutions for Chemical Analysis⁵
- E 203 Test Method for Water Using Karl Fischer Reagent⁵

3. Significance and Use

3.1 These test methods provide for the determination of color and various impurities in acrylonitrile. Color and impurity levels are important factors in many uses of acrylonitrile.

4. Purity of Reagents

4.1 *Purity of Reagents*—Use reagent grade chemicals 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,⁶ where such specifications are available. 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.

4.2 *Purity of Water*—Unless otherwise indicated, references to water shall be understood to mean Type II or Type III reagent water conforming to Specification D 1193.

5. Hazards

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

5.2 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 as well.

5.3 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. Use impermeable protective clothing and consult the current MSDS for recommended materials.

6. Photometers and Photometric Practice

6.1 The photometers and photometric practice described in these test methods shall conform to Practice E 60.

COLOR

7. Procedure

7.1 Determine the color of the acrylonitrile in accordance with Test Method D 1209.

¹ This specification 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.

Current edition approved Oct. 10, 2002. Published February 2003. Originally approved in 1987. Last previous edition approved in 1997 as E 1178 – 97.

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

³ *Annual Book of ASTM Standards*, Vol 06.04.

⁴ *Annual Book of ASTM Standards*, Vol 03.05.

⁵ *Annual Book of ASTM Standards*, Vol 15.05.

⁶ *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.