



Designation: D 2120 - 87

AMERICAN SOCIETY FOR TESTING AND MATERIALS
1916 Race St., Philadelphia, Pa. 19103
Reprinted from the Annual Book of ASTM Standards, Copyright ASTM
If not listed in the current combined index, will appear in the next edition.

Standard Test Method for Inhibitor, *p*-tert-Butylcatechol, in Styrene Monomer¹

This standard is issued under the fixed designation D 2120; 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 measurement of the amount of residual *p*-tert-butylcatechol in styrene monomer in the range from 0 to 100 ppm. Any other compound known to produce color when contacted with aqueous sodium hydroxide solution will interfere, but may be compensated for by including it in the preparation of the standard solutions, if its identity and concentration in the sample are known.

NOTE 1—This test method does not necessarily measure the amount of *p*-tert-butylcatechol originally added to styrene. It is known that the original amount gradually diminishes on storage.

1.2 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems 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. For specific hazard statements, see Section 7.*

2. Referenced Documents

2.1 ASTM Standards:

D 1193 Specification for Reagent Water²

D 3437 Practice for Sampling and Handling Liquid Cyclic Products²

2.2 Other Documents:

OSHA Regulations, 29 CFR, paragraphs 1910.1000 and 1910.1200³

3. Summary of Test Method

3.1 The styrene monomer is extracted with aqueous sodium hydroxide and the aqueous layer, containing the *p*-tert-butylcatechol as the colored quinone, is separated and the color measured.

4. Significance and Use

4.1 This test method is suitable for determining the quantity of inhibitor, both for the protection against polymerization while in transit and storage, and for internal quality control.

¹ This test method is under the jurisdiction of ASTM Committee D-16 on Aromatic Hydrocarbons and Related Chemicals and is the direct responsibility of Subcommittee D16.OH on Styrene, Ethylbenzene, Cumene, and Naphthalene.

Current edition approved May 29, 1987. Published July 1987. Originally published as D 2120 - 62 T. Last previous edition D 2120 - 82.

² *Annual Book of ASTM Standards*, Vol 06.03.

³ Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

5. Apparatus

5.1 *Separatory Funnels*, 125 mL.

5.2 *Pipets*, 1, 2, 5, 10, and 25 mL.

5.3 *Photoelectric Colorimeter or Spectrophotometer*, capable of absorbance measurements in the wavelength region of 485 nm.

5.4 *Sample Cell*—Use the cell with the maximum light path available for the instrument being used.

6. Reagents and Materials

6.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents 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 as defined by Type III of Specification D 1193.

6.3 *Sodium Hydroxide Solution*—40 g/L.

6.4 *Styrene Monomer*, inhibitor-free (**Warning**—see 7.3). Wash styrene monomer three times with equal volumes of NaOH solution. Wash the monomer with water until the washings are neutral to litmus.

NOTE 2—Uninhibited styrene monomer should be kept refrigerated at 0 to 5°C to prevent polymerization.

6.5 *p*-tert-Butylcatechol, *Standard Solution* (125 ppm (mg/kg))—Dissolve 0.113 g of *p*-tert-butylcatechol in 1000 mL of inhibitor-free styrene monomer at 20°C. (**Warning**—See 7.2.)

7. Hazards

7.1 Consult the latest OSHA regulations and supplier's Material Safety Data Sheets regarding all materials used in the procedure.

7.2 *Handling Precautions*—*p*-tert-butylcatechol, particularly when molten or in concentrated solution, is very corrosive to the skin. It is also a systemic poison when taken orally or absorbed in quantity through the skin.

7.3 *Flammable Precautions*—Styrene monomer is flammable and polymerizes exothermally in the presence of peroxide, mineral acids, and aluminum chloride.

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 "Reagent Chemicals and Standards," by Joseph Rosin, D. Van Nostrand Co., Inc., New York, NY, and the "United States Pharmacopeia."