



Designation: D 1872 – 82

AMERICAN SOCIETY FOR TESTING AND MATERIALS

1916 Race St., Philadelphia, Pa. 19103

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Standard Method of Testing RUBBER CHEMICAL—FREE 2- MERCAPTOBENZOTHAZOLE IN BENZOTHAZYL DISULFIDE¹

This standard is issued under the fixed designation D 1872; 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 method covers a procedure for the measurement of the toluene-soluble acidic impurities in benzothiazyl disulfide (MBTS).

2. Applicable Document

2.1 ASTM Standard:

D 3040 Practice for Preparing Precision Statements for Standards Related to Rubber and Rubber Testing²

NOTE 1—The specific dated edition of Practice D 3040 that prevails in this document is referenced in the Precision section.

3. Summary of Method

3.1 The MBTS is dissolved in hot toluene and crystallized out by chilling. The filtered extract is titrated in a nonaqueous medium, using sodium methoxide as the titrant and thymol blue as the indicator.

4. Significance and Use

4.1 2-Mercaptobenzothiazole (MBT) is usually the major impurity in MBTS. Free MBT in MBTS may be determined by this method.

4.2 MBT and MBTS are used for rubber and latex vulcanization acceleration. The amount of MBT in MBTS may be of importance in predicting performance in rubber compounds and for raw material purchase and control.

4.3 This method may be used as a quality-control tool and for research and development work.

5. Apparatus

5.1 *Iodine or Erlenmeyer Flasks*, 250-cm³.

5.2 *Filter Funnels*, sintered glass, medium porosity, 76-mm (3-in.).

5.3 *Magnetic Stirring Apparatus*.

5.4 *Buret*, semimicro, 10-cm³.

6. Reagents

6.1 *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.³ 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 *Sodium Methoxide, Standard Solution (0.1 N)*—Wash approximately 5 g of freshly cut sodium metal with methanol and dissolve in 100 cm³ of absolute methanol in a hood, away from flames. The reaction can be controlled by occasionally cooling the reaction vessel in ice water. When the reaction is complete, add 150 cm³ of methanol and 1500 cm³ of toluene. Store the reagent in a borosilicate glass container

¹ This method is under the jurisdiction of ASTM Committee D-11 on Rubber and is the direct responsibility of Subcommittee D 11.11 on Chemical Analysis.

Current edition approved Oct. 29, 1982. Published January 1983. Originally published as D 1872 – 61 T. Last previous edition D 1872 – 79.

² 1983 *Annual Book of ASTM Standards*, Vols 09.01 and 09.02.

³ "Reagent Chemicals, American Chemical Society Specifications," Am. Chemical Soc., Washington, D.C. 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, N.Y., and the "United States Pharmacopeia."