



Standard Test Method for Carbon Disulfide in Benzene¹

This standard is issued under the fixed designation D 2324; 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.

^{ε1} NOTE—Editorial changes were made throughout in November 1989.

1. Scope

1.1 This test method covers the determination of carbon disulfide in benzene and other hydrocarbons.

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 8 and Note 1.*

2. Referenced Documents

2.1 ASTM Standards:

D 1193 Specification for Reagent Water²

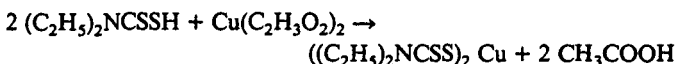
D 3437 Practice for Sampling and Handling Liquid Cyclic Products³

2.2 Other Document:

OSHA Regulations—29 CFR, paragraphs 1910.1000 and 1910.1200⁴

3. Summary of Test Method

3.1 Under specified conditions diethylamine-cupric acetate reagent reacts with carbon disulfide to produce the yellow-orange color of cupric diethyl-dithiocarbamate. The intensity of the color produced is measured by means of a spectrophotometer.



4. Significance and Use

4.1 This test method is suitable for setting specifications for carbon disulfide in benzene, other hydrocarbons, and gases by extraction of CS₂ into an appropriate liquid hydrocarbon. It may also be used as an internal quality control tool and in development or research work. The test method is applicable to benzene that contains 0.1 to 4.0

mg/kg of carbon disulfide, or benzene that can be diluted with carbon disulfide-free benzene to a concentration that falls in this range.

5. Interferences

5.1 Hydrogen sulfide, sulfur dioxide, and xanthates interfere, causing low results. Thiophene in concentrations as high as 100 mg/kg does not interfere. Ordinary variations of light, temperature, and standing time do not affect the results.

6. Apparatus

6.1 *Spectrophotometer*⁵ suitable for measurements at 430 nm with a band width not greater than 35 nm.

6.2 *Cells*, 5-cm, chemically resistant glass.

6.3 *Weighing Bulbs*, either as prepared in the laboratory or commercially supplied.⁶

6.4 *Mohr Pipet*, 5-mL equipped with suction bulb.

7. Reagents and Materials

7.1 *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.⁷ 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.

7.2 *Purity of Water*—Unless otherwise indicated, references to water shall be understood to mean reagent water conforming to Specification D 1193.

7.3 *Benzene*, carbon disulfide-free. To a 2-L separatory funnel add 1000 mL of benzene and 200 mL of alcoholic sodium hydroxide (NaOH) and shake well. Allow to stand 1 h, shaking at 15-min intervals. Draw off and discard the lower layer. Wash 4 times, using 300 mL of water each time, and drawing off and discarding the water (lower) layer after each washing. Filter the treated benzene through dry filter paper into a 1-L glass stoppered bottle. Check the treated benzene for the presence of carbon disulfide as described in Section 11. If carbon disulfide is present, repeat the benzene

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 D16.0A on Benzene, Toluene, Xylenes, Cyclohexane, and Their Derivatives.

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² *Annual Book of ASTM Standards*, Vols 06.03 and 11.01.

³ *Annual Book of ASTM Standards*, Vol 06.03.

⁴ Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

⁵ The Beckman Model DU spectrophotometer, manufactured by Beckman Instruments, Inc., 2500 Harbour Blvd., Mail Station 31D, Fullerton, CA 92634, or equivalent instrument, has been found satisfactory for this purpose.

⁶ Available from Jesse Petty Glass Specialties, Box 509, Glen Ellyn, IL.

⁷ "Reagent Chemicals, American Chemical Society Specifications," Am. Chemical Soc., 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."