



Designation: D2194 – 02 (Reapproved 2007)

Standard Test Method for Concentration of Formaldehyde Solutions¹

This standard is issued under the fixed designation D2194; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope*

1.1 This test method covers the determination of the formaldehyde content of commercially available formaldehyde solutions ranging in concentration from 36 to 55 weight %.

1.2 For purposes of determining conformance of an observed value or a calculated value using this test method to relevant specifications, test result(s) shall be rounded off “to the nearest unit” in the last right-hand digit used in expressing the specification limit, in accordance with the rounding-off method of Practice E29.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 For hazard information and guidance, see the supplier’s Material Safety Data Sheet.

1.5 *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.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D1193 Specification for Reagent Water

E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

3. Summary of Test Method

3.1 The specimen is reacted with an excess of sodium sulfite solution and the resulting sodium hydroxide is titrated with sulfuric acid using thymolphthalein indicator.

¹ This test method is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.35 on Solvents, Plasticizers, and Chemical Intermediates.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard’s Document Summary page on the ASTM website.

3.2 The sample should be essentially neutral; 0.1 % acidity (as formic acid) is equivalent to 0.065 % formaldehyde.

4. Significance and Use

4.1 This test method provides a measurement of formaldehyde content (assay) of formaldehyde solutions. The results of these measurements can be used for specification acceptance.

5. Apparatus

5.1 *Buret*, calibrated, 100-mL, with a 50 or 75-mL reservoir on top of a lower portion calibrated in 0.1-mL divisions. A TFE-fluorocarbon resin stopcock is suitable for this purpose.

5.2 *Erlenmeyer Flask*, 500-mL capacity.

5.3 *Vials*, specimen, short, style, 1 to 1½-dram (4 to 6-mL) capacity.

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 *Purity of Water*—Unless otherwise indicated, references to water shall be understood to mean reagent water conforming to Type IV of Specification D1193.

6.3 *Sodium Sulfite Solution* (125 g/L)—Dissolve 125 g of anhydrous sodium sulfite (Na_2SO_3) in water and dilute to 1 L.

NOTE 1—Sodium sulfite gradually oxidizes to sodium sulfate on exposure to air and therefore should be kept in a tightly closed container. For best results freshly prepared reagent should be used.

6.4 *Sulfuric Acid* (0.5 N)—Prepare and standardize 0.5 N sulfuric acid (H_2SO_4) against 0.5 N sodium hydroxide (NaOH)

³ *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.

*A Summary of Changes section appears at the end of this standard