



Standard Test Method for Iron in Formaldehyde Solutions¹

This standard is issued under the fixed designation D2087; 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 determination of the total iron content of formaldehyde solutions.

1.2 For purposes of determining conformance of an observed 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 evaporated and ashed; the iron, reduced to the divalent state by the addition of hydroxylamine hydrochloride, is reacted with *o*-phenanthroline to develop a color that is measured at 510 nm.

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.

Current edition approved June 1, 2012. Published July 2012. Originally approved in 1962. Last previous edition approved in 2006 as D2087 – 06. DOI: 10.1520/D2087-06R12.

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.

4. Significance and Use

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

5. Apparatus

5.1 *Spectrophotometer*, capable of measuring light absorption at 510 nm.

5.2 *Absorption Cells*, minimum light path, 10 mm.

5.3 *Evaporating Dishes*, 90-mm diameter, high-silica glass.

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 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 as defined by Type IV of Specification D1193.

6.3 *Ammonium Acetate Solution (100 g/L)*—Dissolve 100 g of ammonium acetate ($\text{NH}_4\text{C}_2\text{H}_3\text{O}_2$) in 100 mL of water. Add 200 mL of acetic acid (CH_3COOH), dilute to 1 L with water, and mix.

6.4 *Ammonium Hydroxide (1 + 1)*—Mix equal volumes of concentrated ammonium hydroxide (NH_4OH , sp gr 0.90) and water.

6.5 *Congo Red Paper*.

6.6 *Hydrochloric Acid (1 + 1)*—Mix equal volumes of concentrated hydrochloric acid (HCl , sp gr 1.19) and water.

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