



Designation: D2374 – 05

## Standard Test Method for Lead in Paint Driers by EDTA Method<sup>1</sup>

This standard is issued under the fixed designation D2374; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This test method covers a titrimetric determination of lead in liquid paint driers that can be dissolved in glacial acetic acid and utilizes the disodium salt of ethylenediaminetetraacetic acid dihydrate (EDTA).

1.2 This test method is not applicable to drier blends. If driers other than cobalt are present, they may interfere by reacting with EDTA under the conditions used for analysis.

1.3 All cations that can be titrated with EDTA in alkaline media interfere and must not be present in the sample.

1.4 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

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:*<sup>2</sup>

**D600** Specification for Liquid Paint Driers

**D1193** Specification for Reagent Water

**E180** Practice for Determining the Precision of ASTM Methods for Analysis and Testing of Industrial and Specialty Chemicals

**E300** Practice for Sampling Industrial Chemicals

### 3. Summary of Test Method

3.1 The liquid drier is dissolved in glacial acetic acid, diluted with isopropyl alcohol and water, and treated with an excess of standard EDTA solution. The excess is titrated with standard cupric sulfate solution using PAN as the metal indicator.

<sup>1</sup> 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 D01.21 on Chemical Analysis of Paints and Paint Materials.

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<sup>2</sup> 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 The amount of lead drier used in oxidizing-type coatings significantly affects their drying properties. This test method may be used to confirm the stated lead content of pure liquid lead drier soluble in glacial acetic acid and manufactured for use by the coatings industry.

### 5. Apparatus

5.1 *Centrifuge*, capable of developing 1000 to 2000 g.

### 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.<sup>3</sup> 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 II of Specification **D1193**.

6.3 *Ammonium Chloride* ( $\text{NH}_4\text{Cl}$ ).

6.4 *Ammonium Hydroxide* (*sp gr 0.90*)—Concentrated ammonium hydroxide ( $\text{NH}_4\text{OH}$ ).

6.5 *Buffer Solution (pH 10.0)*—Dissolve 67.5 g of  $\text{NH}_4\text{Cl}$  in water, add 570 mL of concentrated  $\text{NH}_4\text{OH}$  (*sp gr 0.90*), and dilute to 1 L.

6.6 *Cupric Sulfate, Standard Solution (0.05 M)*—Dissolve 12.5 g of cupric sulfate pentahydrate ( $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ ) in water and dilute to 1 L.

6.7 *Eriochrome Black-T Indicator*—Triturate 0.20 g of the concentrated dye with 100 g of NaCl and store in a tightly stoppered jar. This mixture remains stable for several years.

6.8 *EDTA, Standard Solution (0.05 M)*—Dissolve 18.62 g of EDTA in water and dilute to 1 L. Store in a polyethylene or borosilicate glass bottle.

<sup>3</sup> *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.