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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Test Method for Calcium or Zinc in Paint Driers by EDTA Method¹

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^{ε1} NOTE—Section 11 was editorially corrected in June 1994.

1. Scope

1.1 This test method covers a titrimetric determination of calcium in liquid calcium driers and zinc in liquid zinc driers that can be dissolved in a toluene-alcohol mixture and utilizes the disodium salt of ethylenediaminetetraacetic acid dihydrate (EDTA).

1.2 This test method is not applicable to drier blends.

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

1.4 *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:*

D 600 Specification for Liquid Paint Driers²

D 1193 Specification for Reagent Water³

E 180 Practice for Determining the Precision of ASTM Methods for Analysis and Testing of Industrial Chemicals⁴

E 300 Practice for Sampling Industrial Chemicals⁴

3. Summary of Test Method

3.1 The liquid calcium or zinc drier is dissolved in toluene and ethyl alcohol and treated with an excess of standard EDTA solution. The excess is titrated with a standard zinc chloride solution using Eriochrome Black-T as the indicator.

4. Significance and Use

4.1 This test method may be used to confirm the stated calcium or zinc content of pure liquid calcium or zinc driers soluble in toluene-alcohol and manufactured for use by the coatings industry.

¹ This test method is under the jurisdiction of ASTM Committee D-1 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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² *Annual Book of ASTM Standards*, Vol 06.04.

³ *Annual Book of ASTM Standards*, Vol 11.01.

⁴ *Annual Book of ASTM Standards*, Vol 15.05.

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.⁵ 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 D 1193.

6.3 *Buffer Solution*—Add 350 mL of concentrated ammonium hydroxide (NH₄OH, sp gr 0.90) to 54 g of ammonium chloride (NH₄Cl) and dilute to 1 L with water.

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

6.5 *Indicator Mixture*—Triturate 0.2 g of Eriochrome Black-T and 100 g of sodium chloride (NaCl) and store the mixture in a tightly stoppered bottle. This mixture remains stable for several years.

6.6 *Zinc Chloride, Standard Solution (0.05 M)*—Weigh 3.2690 g of zinc metal to 0.5 mg and dissolve in 50 mL of dilute hydrochloric acid (14 mL of concentrated HCl (sp gr 1.42) to 36 mL of water). Warm if necessary. Dilute to 1 L in a volumetric flask.

7. Sampling

7.1 Take a small sample of liquid drier from bulk using the procedures in Practice E 300 appropriate for the size of the container: Section 19 for tanks and tank cars or Section 23 for drums and cans.

NOTE 1—Liquid driers are normally homogeneous so that only simple

⁵ *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 Pharmacopoeia and National Formulary*, U.S. Pharmaceutical Convention, Inc. (USPC), Rockville, MD.