Designation: D 3618 – 85a (Reapproved 1999)

Standard Test Method for Detection of Lead in Paint and Dried Paint Films[1]

This standard is issued under the fixed designation D 3618; 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 is intended as a screening test to determine if the solids in a paint contain more than 0.5 % lead. The test described barely detects the presence of 0.4 % but gives a definite positive result at the 0.5 % level.

NOTE 1—This test method may be used to detect the presence of lead at concentrations higher or lower than 0.5 % by making appropriate changes in the specimen size and reagent quantities specified.

1.2 Paints giving an unexpected positive or questionable result should be analyzed quantitatively for lead, using Test Method D 3335.

1.3 *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.* Specific hazard statements are given in Section 7.

2. Referenced Documents

2.1 *ASTM Standards:*

D 1193 Specification for Reagent Water[2]

D 2832 Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings[3]

D 3335 Test Method for Low Concentrations of Lead, Cadmium, and Cobalt in Paint by Atomic Absorption Spectroscopy[3]

3. Summary of Test Method

3.1 The sample of liquid paint or dried film is prepared by dry ashing a weighed specimen at 475 to 500°C. The ash is extracted with hot sodium hydroxide solution and a drop of the extract is transferred to filter paper. Lead present is oxidized to lead peroxide with bromine water, then treated with "tetrabase" to produce a blue quinoidal salt. Known amounts of lead are added to standard paints that are concurrently tested to provide a base for comparison.

4. Significance and Use

4.1 The permissible level of heavy metals in certain coatings is specified by governmental regulatory agencies. This test method provides a fully documented procedure for determining low concentrations of lead present in both water and solvent-reducible coatings to determine compliance.

5. Apparatus

5.1 *Burner*, Meker-type.

5.2 *Crucibles*, porcelain, high-form, 15-mL, with covers.

5.3 *Filter Paper*, ashless, medium texture.

5.4 *Hot Plate*, with variable surface temperature control over the range from 70 to 200°C.

5.5 *Muffle Furnace*, maintained at 475 ± 25°C.

5.6 *Syringe*, glass, 2-mL.

5.7 *Volumetric Flasks*, 50, 100, 1000-mL.

5.8 *Paint Shaker.*

5.9 *Paint Draw-Down Bar.*

6. Reagents

6.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests unless otherwise specified. 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.[4] 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 grade water conforming to Type II of Specification D 1193.

6.3 *Acetic Acid*, glacial.

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

6.5 *Bromine Water*, saturated.

[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 11.01.

[3] *Annual Book of ASTM Standards*, Vol 06.01.

[4] *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.