



Designation: D 715 – 86 (Reapproved 2003)

Standard Test Methods for Analysis of Barium Sulfate Pigment¹

This standard is issued under the fixed designation D 715; 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 These test methods cover the analysis of barium sulfate pigment.

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

1.3 *This standard does not purport to address the safety concerns 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 185 Test Methods for Coarse Particles in Pigments, Pastes, and Paints²
- D 280 Test Methods for Hygroscopic Moisture (and Other Matter Volatile Under the Test Conditions) in Pigments²
- D 1193 Specification for Reagent Water³
- D 1208 Test Methods for Common Properties of Certain Pigments²
- E 832 Specification for Laboratory Filter Papers⁴

3. Significance and Use

3.1 These test methods are used to determine the purity of barium sulfate and to determine the concentration of known impurities. This information is useful to producers and users as an aid in the manufacture of coatings.

4. Purity of Reagents

4.1 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.

4.2 Unless otherwise indicated, references to water shall be understood to mean reagent water conforming to Type II of Specification D 1193.

BARIUM SULFATE

5. Reagents

5.1 *Ammonium Hydroxide* (sp gr 0.90)—Concentrated ammonium hydroxide (NH₄OH).

5.2 *Ammonium Sulfate* ((NH₄)₂SO₄).

5.3 *Hydrochloric Acid* (sp gr 1.19)—Concentrated hydrochloric acid (HCl).

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

5.5 *Methyl Red Indicator Solution*—Dissolve 0.2 g of methyl red in 100 mL of methanol, ethanol, or isopropanol.

5.6 *Sodium Carbonate Solution* (30 g/L)—Dissolve 30 g of Na₂CO₃ in water and dilute to 1 L.

6. Procedure

6.1 Weigh to 0.1 mg approximately 0.5 g of the sample into a platinum crucible, add 3 g of Na₂CO₃, mix thoroughly, and fuse until the melt is clear. Allow the melt to cool and then leach in a platinum dish with hot water until it is entirely disintegrated. Filter on a close-texture paper and wash thoroughly with hot Na₂CO₃ solution (30 g/L).

6.2 Transfer the filter paper containing the insoluble carbonates to a 250-mL beaker and acidify with concentrated HCl (sp gr 1.19). Wash the fusion crucible with HCl (sp gr 1.19) so that no barium is lost. Boil the solution, filter into a 600-mL beaker, and wash well with water. Add methyl red indicator solution, and add NH₄OH (sp gr 0.90) until the solution is slightly alkaline. Add 6 mL of HCl (1+1), and dilute to 300 mL.

¹ These test methods are under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and are the direct responsibility of Committee D01.31 on Pigment Specifications.

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² *Annual Book of ASTM Standards*, Vol 06.03.

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

⁴ *Annual Book of ASTM Standards*, Vol 14.04.

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 Pharmacopeia and National Formulary*, U.S. Pharmacopeial Convention, Inc. (USPC), Rockville, MD.