Designation: C867 – 94 (Reapproved 2014)

Standard Test Method for Soluble Sulfate in Ceramic Whiteware Clays (Photometric Method) [1]

This standard is issued under the fixed designation C867; 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 soluble sulfate ions present in water or a filtrate by means of a photometer measuring the turbidity of precipitated barium sulfate. A method of standardizing the photometer for this test method is also given.

1.2 Soluble sulfate ions may be removed from clays or clay-water slurries by leaching with water during mixing and subsequent filter pressing. To remove all the sulfate ions would require an impractical number of washings; therefore, this test method should be considered a control test and not a quantitative analysis for SO_4 ions.

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.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

C324 Test Method for Free Moisture in Ceramic Whiteware Clays

D1193 Specification for Reagent Water

2.2 *American Chemical Society Document:*

Specification for Reagent Chemicals[3]

3. Apparatus

3.1 *Balance,* accurate to 0.0001 g.

3.2 *High-Speed Mixer.*

3.3 *Filter Press,* capable of operating at 690 kPa (100 psi).

3.4 *Glass Beakers,* Erlenmeyer Flasks.

3.5 *Transfer Pipets.*

3.6 *Spectrophotometer* and accessories.

3.7 *Measuring Spoon,* to hold approximately 0.2 g of $BaCl_2$ or THQ Cup.

3.8 Other usual laboratory equipment, including timers, etc.

4. Reagents

4.1 *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.[4] Other grades may be used, provided it is first ascertained that the regent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

4.2 *Purity of Water*—Unless otherwise indicated, references to water shall be understood to mean Type IV Grade reagent water as defined in Specification D1193.

4.3 Barium Chloride ($BaCl_2 \cdot H_2O$) crystals, 20 to 30 mesh.

4.4 *Salt-Acid Reagent*—However, it can be prepared from: 23.6 ml HCl, 253.0 gm NaCl, 976.4 ml distilled water. This solution should be stored in an automatic pipettor for accurate measurement.

4.5 *Glycerine Reagent*—a mixture of equal volumes of c. p. glycerine and reagent grade water or it may be purchased from a laboratory supply house. This solution should be stored in an automatic pipettor for accurate measurement.

4.6 *Standard Sulfate Solution*—a solution of c. p. sodium sulfate in reagent grade water at a concentration which contains exactly 100 ppm of sulfate ion.

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[1] This test method is under the jurisdiction of ASTM Committee C21 on Ceramic Whitewares and Related Products and is the direct responsibility of Subcommittee C21.04 on Raw Materials.

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[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.

[3] Available from American Chemical Society, 1155 16th Street, NW, Washington, DC 20036.

[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. Pharmaceutical Convention, Inc. (USPC), Rockville, MD.