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Barium sulphate precipitated for industrial use

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Barium sulphate precipitated for industrial use

1 Scope

This standard specifies the requirements, test methods, inspection rules, markings, labels, packaging, transportation and storage of barium sulphate precipitated for industrial use.

This standard applies to barium sulphate precipitated for industrial use. This product is mainly used in coatings, inks, pigments, rubber, batteries, plastics and coated paper, metal smelting and other industries.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this standard.

GB/T 191-2008 Packaging - Pictorial marking for handling of goods

GB/T 1717-1986 Determination of pH value of an aqueous suspension of pigments

GB/T 3049-2006 Chemical products for industrial use. General method for determination of iron content - 1, 10-Phenanthroline spectrophotometric method

GB/T 5211.2 Determination of matter soluble in water of pigments-Hot extraction method

GB/T 5211.3 Determination of matter volatile of pigments at 105 °C

GB/T 5211.15-2014 General test methods for pigments and extender pigments - Part 15: Determination of oil absorption

GB/T 5950-2008 Method for measurement of whiteness of building materials and non-metal mineral products

GB/T 6003.1-2012 Test sieves - Technical requirements and testing - Part 1: Test sieves of metal wire cloth

GB/T 6678 General principles for sampling chemical products

5.3.2.8 Methyl orange indicator solution: 1 g/L.

5.3.3 Instrument and equipment

5.3.3.1 Platinum crucible with lid.

5.3.3.2 High temperature electric furnace: The temperature can be controlled at 800 °C ± 20 °C and 600 °C ± 20 °C.

5.3.4 Test procedure

Weigh about 1 g of the specimen which had been dried according to 5.4, accurate to 0.0002 g. Place it in a platinum crucible into which 4 g of molten mixture has been added. Mix it uniformly. Then cover another 4 g of molten mixture above it and close the lid. Place the platinum crucible in a high-temperature electric furnace. Melt it at 800 °C ± 20 °C for 40 min. Take it out to cool it down.

In a 250 mL beaker, use 100 mL ~ 150 mL of hot water to leach out the melt. Use a glass rod with a rubber tip to transfer all the white melt to the beaker. Heat to boil it, until the melt is loose. Let it stand for a while. Use the slow quantitative filter paper to filter the supernatant first. Then use the hot anhydrous sodium carbonate solution to wash the insoluble matter by decantation. Transfer the insoluble matter to the filter paper to continue washing until it is free of sulfate (testing method: Take 2 mL of filtrate; add 2 drops of hydrochloric acid solution and 0.5 mL of barium chloride solution; the solution shall remain transparent after 10 min). Discard the filtrate.

Add 30 mL of hot hydrochloric acid solution to the funnel, in six times, to dissolve the precipitate. After adding the hydrochloric acid solution, quickly place the watch glass on the funnel. Collect the filtrate in a 500 mL beaker. After adding the hydrochloric acid solution each time, use hot water to wash it once. After the hydrochloric acid solution is completely added, use hot water to rinse the watch glass and the filter paper on the funnel, until it is free of chloride (Testing method: Take 2 mL of filtrate; add 0.5 mL of silver nitrate solution; it shall remain transparent after 5 min). Add 2 ~ 3 drops of methyl orange indicator solution in the filtrate, use ammonia solution to neutralize until it becomes pale yellow. Add 2 mL of hydrochloric acid solution. Finally add water to adjust the solution volume to 400 mL.

Heat the solution to boiling. Add 20 mL of hot sulfuric acid solution at a uniform rate under stirring. Control the addition within 2 min ~ 2.5 min. Cover the watch glass. Place the beaker on the boiling water bath for 2 h or room temperature for more than 12 h. Use slow quantitative filter paper to filter it. Use hot water to rinse the precipitate until the filtrate is free of chloride (the testing method is the same as before). Place the precipitate and filter paper in a porcelain crucible that was burned to constant temperature at 600 °C ± 20 °C in advance. Dry and

5.7 Determination of whiteness

5.7.1 Instrument and equipment

5.7.1.1 Whiteness meter: Same as Chapter 5 of GB/T 5950-2008.

5.7.1.2 Standard whiteboard: Same as Chapter 6 of GB/T 5950-2008.

5.7.2 Test procedure

Same as Chapter 7 and Chapter 8 of GB/T 5950-2008.

5.7.3 Processing of test data

As specified in Chapter 9 of GB/T 5950-2008, it is calculated using the blue light whiteness formula.

Take the arithmetic mean of the parallel determination results as the measurement result. The absolute difference between the parallel determination results is not more than 1.0.

5.8 Determination of oil absorption

5.8.1 Reagents or materials

Same as Chapter 4 of GB/T 5211.15-2014.

5.8.2 Instrument and equipment

Same as Chapter 5 of GB/T 5211.15-2014.

5.8.3 Test procedure

Weigh about 10 g of specimen, accurate to 0.01 g. Put it on a flat plate. From a drip bottle which contains refined linseed oil of known mass (accurate to 0.01 g), add refined linseed oil dropwise, 4 ~ 5 drops a time. After each addition, use a knife to continually press-grind it forcedly. When approaching to the end point, it shall add it dropwise. After finishing the last drop, the specimen is wetted by the oil and forms a whole block. When it is not cracked or broken when spreading, and can adhere to the flat plate, it is used as the end point. All operations shall be completed within 20 min ~ 25 min. Finally weigh the mass of the drip bottle.

5.8.4 Processing of test data

The oil absorption is calculated by w_3. The value is expressed by the mass of oil absorbed per 100 g of sample, calculated according to formula (3):

5.11.2.2 Iodine solution: c (1 / 2I_2) ≈0.01 mol/L. Pipette 10 mL of the iodine standard titration solution prepared according to 5.9.1 in HG/T 3696.1-2011. Place it in a 100 mL brown volumetric flask. Use water to dilute it to the mark. Shake it uniformly.

5.11.2.3 Starch indicator solution: 5 g/L. Weigh 0.5 g of starch. Add 5 mL of water to make it into a paste. Add the paste to 90 mL of boiling water whilst stirring it. Boil it for 1 min ~ 2 min. Cool it down. Dilute it to 100 mL. The period of use is two weeks.

5.11.2.4 Sodium thiosulfate standard titration solution: c ($Na_2S_2O_3$) ≈0.01 mol/L. Pipette 25 mL of sodium thiosulfate standard titration solution prepared and calibrated according to 5.6 of HG/T 3696.1-2011 in a 250 mL volumetric flask. Use water to dilute it to the mark. Shake it uniformly.

5.11.3 Test procedure

Weigh about 10 g of specimen, accurate to 0.01 g. Place it in a 250 mL (V_2) volumetric flask. Add 100 mL of water. Add the stopper. Shake it vigorously for 2 min. Use water to dilute it to the mark. Shake it uniformly. Filter it. Discard the initial 20 mL of filtrate. If the filtrate is cloudy, it shall be returned to re-filter it, until the filtrate is clear. Pipette 100 mL (V_1) of filtrate into a 250 mL iodine flask. Use a pipette to add 5 mL of iodine solution and 5 mL of acetic acid solution. Use water to seal it. Shake it uniformly. Place it in a dark place for 5 min. Use the sodium thiosulfate standard titration solution to titrate it. When approaching to the end point, add 2 mL of starch solution. Continuously use sodium thiosulfate standard titration solution to titrate it, until the blue color disappears, which is used as the end point.

Do a blank test at the same time. Except that no sample is added, the types and amounts of other reagents added (except standard titration solution) are exactly the same as the test solution; meanwhile it is treated in the same way as the sample.

5.11.4 Processing of test data

The content of sulfide is calculated by the mass fraction w_5 of sulfur (S), according to formula (5):

$$w_5 = \frac{[(V_0 - V)/1\,000]cM}{m \times (V_1/V_2)} \times 100\% \qquad \cdots\cdots(5)$$

Where:

V_0 - The value of the volume of sodium thiosulfate standard titration solution consumed in the titration of the blank test solution, in milliliters (mL);

6 Inspection rules

6.1 This standard uses type inspection and exit-factory inspection. Type inspection and exit-factory inspection shall meet the following requirements:

a) All the index items specified in the requirements are type inspection items. Under normal production conditions, the type inspection shall be conducted at least once every three months. In one of the following situations, type inspection shall be carried out:

- Update of key production process;

- Change of main raw materials;

- Production restoration after suspension;

- Big difference from the last type inspection;

- Contract provisions.

b) The eight indicators of barium sulfate content, volatile content at 105 °C, water soluble content, iron content, whiteness, oil absorption, pH, fineness as specified in the requirements are exit-factory inspection items and shall be inspected batch by batch.

6.2 The barium sulphate precipitated for industrial use of the same grade as produced continuously (or by the same shift) by the manufacturer using the same materials, basically the same production conditions form a batch. Each batch of products does not exceed 120 t.

6.3 Determine the number of sampling units according to the provisions of GB/T 6678. When sampling, the sampler is inserted vertically from the center of the packaging bag to sample at 3/4 of the depth of the material layer. Mix the sampled products. Use the quartile method to reduce to not less than 1000 g. Put the sample into two clean and dry containers. Seal it. Paste the label, indicating the manufacturer name, product name, grade, batch number, sampling date, sampler's name. One is used for inspection and the other is retained for future reference. The retention time is determined by the manufacturer according to the actual situation.

6.4 If an index of inspection results does not meet the requirements of this standard, it shall take sample from twice the amount of packaging for re-inspection. If an index of the re-inspection does not meet the requirements of this standard, the entire batch of products is unqualified.

6.5 Use the rounding value comparison method as specified in GB/T 8170 to determine whether the inspection result meets the standard.

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