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Antimony trioxide

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Antimony trioxide

1 Scope

This standard specifies the requirements, test methods, inspection rules and markings, packaging, transportation, storage, quality certificates, and contracts (or purchase orders) for antimony trioxide (commonly known as antimony white).

This standard applies to antimony trioxide produced from antimony concentrates. Antimony trioxide products are mainly used as flame retardant synergists in flame retardants for plastics, resins, rubber, textiles, paints and other flammable materials, and catalysts for petrochemicals and synthetic fibers. Antimony trioxide products are widely used in automobiles, home appliances, computers, electricity, electrical appliances, communications, petrochemicals, machinery manufacturing, aerospace, military industries, etc.

2 Normative references

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

GB/T 3253(all parts) Methods for chemical analysis of antimony and antimony trioxide

GB/T 5211.16 Comparison of lightening power of white pigments

GB/T 5211.17 Comparison of contrast ratio (hiding power) of white pigments

YS/T 324 Test method for physical properties of antimony trioxide

3 Requirements

3.1 Product classification

The antimony trioxide is divided into four grades: Sb_2O_3 99.90, Sb_2O_3 99.80, Sb_2O_3 99.50, and Sb_2O_3 99.00 according to its chemical composition and physical properties.

3.2 Chemical composition

4.6 The measurement of hiding power shall be carried out in accordance with the provisions of GB/T 3211.17 (Translator's note: Should be GB/T 5211.17).

4.7 The determination of cubic crystal content shall be carried out in accordance with the provisions of Appendix A.

4.8 The measurement of transmittance in EG solution shall be carried out in accordance with the provisions of Appendix B.

4.9 The surface quality shall be determined by visual inspection.

5 Inspection rules

5.1 Inspection and acceptance

5.1.1 Products shall be inspected by the supplier's quality supervision department to ensure that product quality complies with the provisions of this standard, and a quality certificate shall be filled out.

5.1.2 The purchaser may inspect the received products in accordance with the provisions of this standard and the contract (or purchase order). If the inspection results are inconsistent with the provisions of this standard and the contract (or purchase order), they shall be reported to the supplier within 60 days (half a year for export products) from the date of receipt of the product, and the supplier and the purchaser shall negotiate and resolve. If arbitration is required, sampling shall be carried out jointly on the purchaser's site.

5.2 Batch grouping

Products shall be submitted for inspection in batches, each batch shall be composed of the same grade, and the weight of each batch shall not exceed 20 t.

5.3 Inspection items

Each batch of products shall be inspected for chemical composition and physical properties according to the items listed in Table 1.

5.4 Sampling and specimen preparation

5.4.1 Take one bag from every 10 bags in the same batch of products as a sample bag. If a batch of products is less than 10 bags, each bag will be taken as a sample bag.

5.4.2 Use a stainless-steel sampling tube to take the sample from the center of each sample bag, and the sample volume of each bag shall not be less than 40 g. After the sample is taken out, it shall be quickly put into a dry, clean, and airtight container.

5.4.3 Mix the sample thoroughly in a clean place, reduce the amount to 300 g~500 g by using the quartering method, and then divide it into two portions, one portion is used as the specimen for inspection, and the other portion is used for future reference.

5.4.4 When the purchaser has quality objections, after negotiation between the supplier and the purchaser, if resampling is required, one bag from every 5 bags in the batch of products can be used as a sample bag; then, the specimen for arbitration inspection is prepared according to 5.4.2 and 5.4.3. The specimen shall be sent to a testing agency recognized by both parties for inspection, and the inspection result is the result of arbitration analysis.

5.4.5 Judgment of inspection results

5.4.5.1 If any indicator in the inspection results does not meet the requirements of this standard or the (ordering contract), the batch of products will be deemed unqualified.

5.4.5.2 If the supply and demand parties have objections to the physical and chemical analysis results of antimony trioxide products, the product shall be determined based on the arbitration analysis results.

6 Marking, packaging, transportation, storage, and quality certificates

6.1 Marking

Antimony trioxide packaging bags shall be painted with marks that are not easy to fall off:

- a) Manufacturer's name;
- b) Product name and grade;
- c) Trademark;
- d) Batch number;
- e) Net weight.

6.2 Packaging

The product is packed in double-layer bags, with the outer layer using paper bags and the inner layer using plastic film bags. The net weight of each bag is 25 kg. Packaging materials shall ensure strength and not affect product quality.

According to user requirements, it can be packaged in tons or half tons.

Appendix A

(Normative)

Method for determining cubic crystal content of antimony trioxide

A.1 Scope

This appendix specifies the method for determining the cubic crystal content of antimony trioxide by using the X-ray diffractometer method.

This appendix is applicable to the determination of the cubic crystal content of antimony trioxide. The measurement range of cubic crystal content is 60%~100%.

A.2 Summary of methods

After the antimony trioxide sample is made into a block, it is diffracted by X-rays emitted by an X-ray tube in a goniometer, and its diffraction spectral lines are recorded. The diffraction intensities of the cubic phase diffraction peak (2θ is 13.727°) and the orthorhombic phase diffraction peak (2θ is 19.389°) are measured; then, the content of cubic and orthorhombic phases can be calculated according to the calculation formula of the content of each phase and its diffraction intensity in the polycrystalline material.

A.3 Instruments and test conditions

A.3.1 Instrument: X-ray diffractometer.

A.3.2 Environmental conditions: The working environment temperature is 10°C ~ 35°C , and the relative humidity of the environment is 30%~80%.

A.3.3 Instrument test conditions: Cu target; the wavelength is $1.54178\text{ \AA}$, X-ray tube pressure is 35 kV and tube flow is 30 mA; the mode is θ and 2θ combined drive, scanning range (2θ) is 12° ~ 22° continuous scanning, the nickel filter is used, and scanning speed is $0.04^\circ/\text{s}$; the sampling time is 1 s, the divergence slit is 0.5° , the scattering slit is 0.5° , and the receiving slit is 0.4 mm.

A.4 Specimen preparation and requirements

A.4.1 Specimen requirements

The specimen shall be dry. When damp, it shall be baked in an oven at 100°C ~ 110°C for 1 hour and then cooled to room temperature before specimen preparation.

A.4.2 Specimen preparation

Appendix B

(Normative)

Method for determining transmittance in EG solution of antimony trioxide

B.1 Scope

This appendix specifies the method for determining the transmittance in EG solution of antimony trioxide.

This appendix is applicable to the determination of the transmittance in EG solution of antimony trioxide. Measuring range: transmittance in EG solution is 90%~100%.

B.2 Summary of methods

Place the specimen in ethylene glycol and reflux in an oil bath at 170 °C for 1 hour. After the solution is cooled, use a spectrophotometer to measure the transmittance at 460 nm by using ethylene glycol as a reference.

B.3 Reagents

Ethylene glycol (analytical grade)

B.4 Instruments and utensils

B.4.1 Spectrophotometer.

B.4.2 Constant temperature oil bath (with magnetic stirring).

B.4.3 Cuvette (1 cm).

B.5 Analysis steps

B.5.1 Weigh 2.00 g of the specimen into a 250 mL ground-mouth conical flask, add 100 mL of ethylene glycol, and insert an air condenser tube into the mouth of the conical flask; put the conical flask into an oil bath, and coldly reflux in magnetic-stirring water at 170 °C for 1 hour; when the specimen is completely dissolved, remove and cool to room temperature.

B.5.2 Pipette part of the test solution into a 1 cm cuvette, use ethylene glycol as a reference, and measure the transmittance at a wavelength of 460 nm with a spectrophotometer.

B.6 Result representation

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