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OF THE PEOPLE'S REPUBLIC OF CHINA

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High purity selenium

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High purity selenium

1 Scope

This standard specifies the requirements, test methods, inspection rules, marking, packaging, transportation, storage, quality certificate, contract (or purchase order) contents and safety tips for high-purity selenium.

This standard applies to high-purity selenium produced by the redox method, distillation method and other processes. The products are mainly used in the manufacture of compound semiconductors, thermoelectric conversion, photosensitive materials, polycrystalline thin film materials for infrared detection and thin-film solar cell materials.

2 Normative references

The following documents are essential for the application of this document. For any dated referenced document, only the dated version applies to this document. For any undated referenced document, the latest version (including all amendments) applies to this document.

GB/T 8170 Rules of rounding off for numerical values & expression and judgment of limiting values

GB/T 26289 Methods for chemical analysis of high purity selenium - Determination of boron, aluminum, iron, zinc, arsenic, silver, tin, antimony, tellurium, mercury, magnesium, titanium, nickel, copper, gallium, cadmium, indium, lead and bismuth contents - Inductively coupled plasma mass spectrometry

3 Technical requirements

3.1 Product categories

High-purity selenium is divided into two grades according to its chemical composition: Se99.9999 and Se99.999.

3.2 Chemical composition

The chemical composition of high-purity selenium shall comply with the requirements of Table 1.

3.3 Physical requirements

3.3.1 Products can be supplied in block, granular or powder form.

3.3.2 The weight of high-purity selenium blocks, particle diameter of selenium particles and particle size of selenium powder shall be determined by negotiation between the supplier and the buyer.

3.4 Surface quality

3.4.1 High-purity selenium is black or dark gray. Products in the same batch shall have uniform color and no visible differences.

3.4.2 High-purity selenium shall not contain foreign inclusions and contaminants.

3.5 Others

If the purchaser has other requirements for the chemical composition and surface quality of high-purity selenium, they shall be determined through consultation between the supply and demand parties.

4 Test methods

4.1 The chemical composition analysis method of high-purity selenium shall be carried out in accordance with the provisions of GB/T 26289. If it exceeds the analysis range, it shall be negotiated by the supply and demand parties.

4.2 The particle size of selenium powder shall be tested by screening with a standard sieve.

4.3 The surface quality of the product shall be inspected visually.

5 Inspection rules

5.1 Inspection and acceptance

5.1.1 High-purity selenium shall be inspected by the supplier's technical supervision department to ensure that the product quality complies with the provisions of this standard or the contract (or purchase order), and a quality certificate shall be completed.

5.1.2 Upon receipt of the product, the purchaser may inspect the product in accordance with the provisions of this standard. If the inspection results are inconsistent with the provisions of this standard or the contract (or purchase order), the purchaser shall raise the issue within 30 days of receipt of the product and the dispute shall be resolved through negotiation between the purchaser and the supplier. If arbitration is required, the sampling for arbitration shall be at the purchaser's side and conducted through mutual consultation between the purchaser and the supplier.

5.2 Batching

High-purity selenium shall be submitted for acceptance in batches. Each batch shall consist of high-purity selenium of the same grade and specification, and each batch shall not exceed 1000 kg.

5.3 Inspection items

Each batch of products shall be tested for chemical composition, surface quality and weight.

5.4 Sampling and sample preparation

5.4.1 Sampling and preparation of the chemical composition of selenium ingots

Samples are taken from each batch of products during the casting process. After the material is melted in a high-purity graphite furnace, about 20 g of the product is taken out with a quartz or titanium sample spoon as a sample. The sample is collected from each heat, and the total amount shall be no less than 300 g. After crushing and grinding, it is divided into three portions. The supply and demand parties each retain one portion, and the other portion is used for arbitration.

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