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Yellow phosphorus for industrial use

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Yellow phosphorus for industrial use

CAUTION -- According to the provisions of Clause 6 of GB 12268-2012, this product belongs to Class 4, Item 4.2 SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION and Class 6, Item 6.1 TOXIC SUBSTANCES, and shall be handled with care. Specimens and some reagents used in the test methods of this Standard are toxic, flammable or corrosive, and must be handled with care in a fume hood! If splashed on the skin, rinse immediately with water, and severe cases shall be treated immediately. When using substances liable to spontaneous combustion, it is strictly prohibited to use open flames for heating.

1 Scope

This Standard specifies the requirements, test methods, inspection rules, signs, labels, packaging, transportation, storage and safety of yellow phosphorus for industrial use.

This Standard applies to yellow phosphorus for industrial use. It is mainly used in the manufacture of red phosphorus, phosphoric acid, phosphorus compounds and phosphates.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB 190-2009 Packing symbol of dangerous goods

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

GB/T 6678 General principles for sampling chemical products

GB/T 6682-2008 Water for analytical laboratory use - Specification and test methods

GB/T 7686-2016 General method for determination of arsenic content of chemical products

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

5.6 Determination of carbon disulfide insoluble matters

5.6.1 Principle

The yellow phosphorus specimen is dissolved in carbon disulfide, and the content of carbon disulfide insoluble matters is calculated after suction filtration, drying, and weighing.

5.6.2 Reagents or materials

5.6.2.1 Carbon disulfide.

5.6.2.2 absolute ethanol.

5.6.3 Equipment

5.6.3.1 Glass sand crucible: the filter plate's pore size is $5\ \mu\text{m} \sim 15\ \mu\text{m}$.

5.6.3.2 Electric heating constant temperature drying oven: the temperature can be controlled at $105\ ^\circ\text{C} \sim 110\ ^\circ\text{C}$.

5.6.4 Test procedure

TAKE about 3 g ~ 5 g of specimen with tweezers, quickly BLOT the moisture attached to the surface of the specimen with filter paper, and PLACE it in a 50 mL beaker containing ethanol to dehydrate. TAKE it out with tweezers, BLOT dry with filter paper and quickly PUT it into a weighed weighing bottle containing water for weighing, to the nearest 0.01 g. CONNECT a glass sand crucible which has been baked to a constant mass at $105\ ^\circ\text{C} \sim 110\ ^\circ\text{C}$ TO a vacuum suction filter bottle. ADD 15 mL of carbon disulfide to the glass sand crucible. Quickly BLOT the moisture attached to the surface of the weighed yellow phosphorus specimen with filter paper, and PLACE it in the glass sand crucible. After the yellow phosphorus is dissolved, a vacuum pump with adsorption and buffer device is connected for suction filtration (see Annex A for disposal of filtrates). STOP suction filtration when the liquid layer is nearly dry. ADD 5 mL of carbon disulfide, and PERFORM suction filtration after it is dissolved. REPEAT this operation until the yellow phosphorus is completely dissolved and filtered, that is, there is no white smoke when the filtrate is dripped on the filter paper and evaporated. PLACE the washed glass sand crucible at room temperature; after the carbon disulfide has completely evaporated, it is placed in an electric constant temperature drying oven at $105\ ^\circ\text{C}$ to $110\ ^\circ\text{C}$ and dried to a constant mass (to the nearest 0.0001 g).

5.6.5 Test data processing

The content of carbon disulfide insoluble matters is calculated by mass fraction w_4 , which is calculated according to formula (4):

m_3 - the value of the mass of the weighing bottle containing water, in grams (g);

m_4 - the value of the weight of the weighing bottle containing water and the yellow phosphorus specimen, in grams (g);

V - the volume of the test solution transferred, in milliliters (mL).

Take the arithmetic mean of the parallel determination results as the determination result. The absolute difference between the two parallel determination results is not greater than 0.0005 %.

6 Inspection rules

6.1 The index items listed in the requirements of this Standard are all factory-exit inspection items and shall be inspected batch by batch.

6.2 Yellow phosphorus for industrial use produced by the same manufacturing enterprise, using the same materials, under basically the same production conditions, continuously produced or produced by the same working group, of the same grade is a batch. Each batch of products does not exceed 100 t.

6.3 It shall determine the number of sampling units according to GB/T 6678. Each steel drum is a packaging unit. When packing in tanks, sample from each tank. When sampling, HEAT to melt the yellow phosphorus in steel drums or tanks, OPEN the cone valve of the sampler (shown in Figure 2), and INSERT the sampler vertically into the bottom. CLOSE the conical valve, STAY for a while and then LIFT the sampler. PUT the specimen in the tube into a sample cup containing hot water (the sample cup can use an enamel cup with a volume of 1 L), and PLACE the sample cup in a metal bucket containing hot water. The sampling amount shall not be less than 500 g. ATTACH a label on the sample cup, indicating manufacturing factory's name, product name, grade, batch number, sampling date, and sampler's name, and indicating the words "SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION" and "TOXIC SUBSTANCES".

6.4 If there are any indexes in the inspection results that do not meet the requirements of this Standard, it shall reinspect with samples taken from twice the amount of packaging. Even if there is only one index in the reinspection results that does not meet the requirements of this Standard, the entire batch of products is unqualified.

6.5 Use the rounding off value comparison method specified in GB/T 8170 to determine whether the inspection results meet the standard.

7 Signs and labels

7.1 The packaging container of yellow phosphorus for industrial use shall have firm and clear signs, including: manufacturing factory's name, factory address, product name, grade, net content, batch number or production date, number of this Standard and "SUBSTANCE LIABLE TO SPONTANEOUS COMBUSTION" and "TOXIC SUBSTANCE" signs specified in GB 190-2009 and "THIS SIDE UP" and "NO TUMBLE" signs specified in GB/T 191-2008.

7.2 Each batch of yellow phosphorus for industrial use leaving the factory shall be accompanied by a quality certificate, including: manufacturing factory's name, factory address, product name, grade, net content, batch number or production date, a certificate indicates that the product quality complies with this Standard and number of this Standard.

8 Packaging, transportation and storage

8.1 The packaging category of yellow phosphorus for industrial use shall comply with the requirements of Table 1 in GB 12268-2012, and the mass limit of the package shall meet the requirements of Annex A in GB 12463-2009. When railway transportation is used, the packaging shall also meet the requirements of "Interim Provisions on the Management of Transport of Dangerous Goods by Railways". The packaging of yellow phosphorus for industrial use shall meet the requirements of GB 19358 and GB 16473.

8.2 The transportation of yellow phosphorus for industrial use shall comply with the provisions of "Interim Provisions on the Management of Transport of Dangerous Goods by Railways" and "Regulations on the Transport of Dangerous Goods by Cars". Covers shall be provided during transportation to prevent direct sunlight and rain. It shall prevent violent impact. It shall prevent damage to the packaging. It is strictly prohibited to transport with oxidants, foaming agents, halogens, and metal powders. Handle with care when loading and unloading. It is strictly prohibited to bump the packaging barrel. It shall not be inverted.

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