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Calcium Hypochlorite

次氯酸钙（漂粉精）

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Calcium Hypochlorite

Warning -- Calcium hypochlorite is corrosive and oxidizing. Personnel using this standard shall have practical experience in formal laboratory work. This standard does not point out all possible safety issues. The user is responsible for taking appropriate safety and health measures and ensuring compliance with the conditions stipulated by relevant national regulations.

1 Scope

This Standard specifies the requirements, sampling, test methods, inspection rules, marking, packaging, transportation and storage of calcium hypochlorite (bleaching powder concentrated).

This Standard is applicable to calcium hypochlorite (bleaching powder concentrated) (hereinafter referred to as the product).

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) is applicable to this document.

GB 190 Packing Symbol of Dangerous Goods

GB/T 191 Packaging – Pictorial Marking for Handling of Goods

GB/T 601 Chemical Reagent - Preparations of Standard Volumetric Solutions

GB/T 603 Chemical Reagent - Preparations of Reagent Solutions for Use in Test Methods

GB/T 6003.1 Test Sieves - Technical Requirements and Testing - Part 1: Test Sieves of Metal Wire Cloth

GB/T 6678 General Principles for Sampling Chemical Products

GB/T 6679 General Rules for Sampling of Solid Chemical Products

GB/T 6682 Water for Analytical Laboratory Use - Specification and Test Methods

5 Test Methods

5.1 Test provisions

The reagents and water used in this standard refer to analytically-pure reagents and the Class-III water specified in GB/T 6682 when other requirements are not specified. The preparation of standard titration solutions, formulations and products used in the test, unless other requirements are specified, are prepared in accordance with the provisions of GB/T 601 and GB/T 603.

5.2 Appearance

Observe the sample visually under natural light.

5.3 Determination of available chlorine

5.3.1 Principle of the method

In an acidic medium, hypochlorite reacts with potassium iodide to precipitate iodine. Use starch as an indicator, titrate by sodium thiosulfate standard titration solution, and the disappearance of blue is the end point. The reaction formula is as follows:

$$ClO^- + 2I^- + 2H^+ = H_2O + Cl^- + I_2$$

$$I_2 + 2S_2O_3^{2-} = S_4O_6^{2-} + 2I^-$$

5.3.2 Reagents and solutions

Warning – sulfuric acid is highly corrosive.

5.3.2.1 Potassium iodide solution: 100g/L. Take 100g of potassium iodide and dissolve it in 1000mL of water.

5.3.2.2 Sulfuric acid solution: 3+100. Take 30mL of sulfuric acid; slowly pour it into 1000mL of water; cool off; and shake well.

5.3.2.3 Sodium thiosulfate standard titration solution: $c(Na_2S_2O_3)$ = 0.1mol/L.

5.3.2.4 Soluble starch solution: 10g/L. The use period is two weeks.

5.3.3 Apparatus

5.3.3.1 General laboratory equipment.

5.3.3.2 Burette: 50mL, Grade-A, scale value of 0.1mL.

5.3.3.3 One-mark pipette: 25mL, Grade-A.

The water and toluene in the sample azeotrope when heated; use the nature that the toluene and water are immiscible to separate the water.

5.4.1.2 Reagents

Toluene. Dehydrate before use.

5.4.1.3 Apparatus

5.4.1.3.1 General laboratory equipment.

5.4.1.3.2 Moisture measuring device: moisture measuring device and glycerin bath or adjustable temperature electric heating jacket (accuracy of ± 1°C, see Figure 1).

5.4.1.3.3 Moisture measuring device: 500mL round bottom flask and measuring tube. Among them, the volume of the measuring tube is 10mL (the scale value of 0mL~0.3mL is 0.03mL).

5.4.1.4 Test procedures

Take about 100g of the sample (accurate to 0.01g); place it in a dry 500mL flask (b in Figure 1); and add 200mL of toluene (limited to the submerged sample). Install the instrument according to Figure 1; the system is airtight; and turn on the cooling water of the condenser (d in Figure 1). Slowly heat in a glycerin bath or adjustable temperature electric heating jacket (a in Figure 1); keep the temperature at 135°C ~140°C; perform reflux; and control the reflux speed to 2 drops/s~4 drops/s. When the water layer of the solution in the metering tube (c in Figure 1) no longer increases, stop heating and cooling. After the interface between toluene and water in the measuring tube (c in Figure 1) is clear, record the volume of water V_2. Refer to Appendix A for the density of water at different temperatures.

more than 0.2%. Take the arithmetic mean of the parallel determination results as the measurement result.

5.4.2 Drying method

5.4.2.1 Principle of the method

Lay the quantitative sample in a weighing bottle for the specified size and heat it at the specified temperature. Then weigh it.

5.4.2.2 Apparatus

5.4.2.2.1 General laboratory equipment.

5.4.2.2.2 Infrared quick dryer or electric heating blast drying oven, may be controlled at 105°C ~115°C.

5.4.2.2.3 Weighing bottle: ϕ60mm×30mm.

5.4.2.3 Test procedures

Use a weighing bottle to weigh about 5g of sample (accurate to 0.01g); place it in the middle of the infrared lamp of the rapid dryer or in a drying oven; and dry it at 105°C ~115°C for 30min. Cool to room temperature and weigh it.

5.4.2.4 Test data processing

The moisture is expressed by the mass fraction, w_3, of water (H_2O), and calculated according to Formula (3):

$$w_3 = \frac{m_3 - m_4}{m_3} \times 100\% \qquad \cdots\cdots (3)$$

Where:

m_3 – the value of mass of the sample, in g;

m_4 – the value of the mass of the dried sample, in g.

5.4.2.5 Tolerance

The absolute value of the difference between the parallel determination results is no more than 0.2%. Take the arithmetic mean of the parallel determination results as the measurement result.

5.5 Stability inspection - determination of the available chlorine loss

5.5.1 Principle of the method

Type inspection shall also be carried out in one of the following situations:

--- The key production process has changed;

--- The main raw materials have changed;

--- Resume production after stopping production;

--- After major production equipment are adjusted significantly.

6.2 Judgment and reinspection rules

6.2.1 Judgment rules

6.2.1.1 Product quality indicators shall be judged according to the "Round-off Comparison Method " specified in GB/T 8170.

6.2.1.2 The product shall be inspected by the quality inspection department of the manufacturer in accordance with the provisions of this Standard; and the quality of the product shall be judged based on the inspection results and standard requirements; and a quality certificate shall be provided.

6.2.1.3 When the product leaves the factory, each batch of products shall be accompanied by a quality certificate, which includes: the name of the company, product name, model, batch number or production date, batch size, product quality certification that conforms to this Standard, the implementation standard number, and the company's quality control seal.

6.2.2 Reinspection rules

If an indicator of the inspection result does not meet the requirements of this Standard, double sampling units from the same batch of products shall be taken for reinspection. Even if there is an indicator that does not meet the requirements of this standard in the reinspection results, this batch of products is judged to be unqualified.

7 Marking, Packaging, Transportation and Storage

7.1 Marking

The outer packaging of the ex-factory product shall have an obvious and firm mark, which includes: company name, address, product name (labelling: sodium method or calcium method), model, net content, batch number or production date, production license number and logo, this Standard number, "oxidant" and "corrosive" signs specified in GB 190. The outer packaging should also have the "fear of rain" sign specified in GB/T 191.

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