GB

NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

GB 1886.328-2021

National food safety standard Food additives - Disodium dihydrogen pyrophosphate

食品安全国家标准

食品添加剂 焦磷酸二氢二钠

Issued on: February 22, 2021 **Implemented on: August 22, 2021**

Issued by: National Health Commission of the People's Republic of China; State Administration for Market Regulation.

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1 Scope

This Standard is applicable to the food additive, disodium dihydrogen pyrophosphate, that is produced with sodium carbonate (or sodium hydroxide, sodium dihydrogen phosphate) and food additive phosphoric acid (including wet-process phosphoric acid) as raw materials.

2 Molecular formula and relative molecular mass

2.1 Molecular formula

$Na_2H_2P_2O_7$

2.2 Relative molecular mass

221.94 (according to 2018 international relative atomic mass)

3 Technical requirements

3.1 Sensory requirements

The sensory requirements shall meet the requirements of Table 1.

3.2 Physical and chemical indicators

The physical and chemical indicators shall meet the requirements of Table 2.

Table 2 -- Physical and chemical indicators

Annex A

(informative)

Detection limit of different matrix specimens

WARNING: Some reagents used in this test method are toxic or corrosive, so be careful when operating! When necessary, it shall be carried out in a fume hood. If splashed on the skin, rinse immediately with water. Severe cases shall be treated immediately.

A.1 General provisions

The reagents and water used in this Standard refer to analytically-pure reagents and the grade three water specified in GB/T 6682 when other requirements are not indicated. The standard titration solution, standard solution for impurity determination, preparations and products used in the test are all prepared in accordance with the provisions of GB/T 601, GB/T 602, and GB/T 603 when other requirements are not specified. The solution used refers to an aqueous solution when it is not specified which solvent is used for preparation.

A.2 Identification test

A.2.1 Reagents and materials

A.2.1.1 Hydrochloric acid.

A.2.1.2 Nitric acid solution: 1+9.

A.2.1.3 Quinomolimidone solution.

A.2.2 Identification methods

A.2.2.1 Identification of pyrophosphate

The identification of pyrophosphate is carried out according to the following method:

a) Specimen solution: Dissolve 0.1g of specimen in 100mL of nitric acid solution;

b) Test solution A: Drop 0.5mL of specimen solution into 30mL of quinmolybdenone solution;

c) Test solution B: Heat the remaining specimen solution at 95°C for 10min. Take 0.5mL of this solution and drop it into 30mL of quinmolybdenone

e) If using sodium pyrophosphate decahydrate, weigh 80g. Operate according to the first and second crystallization methods.

A.3.2.4 Sodium hydroxide standard titration solution: c(NaOH)=0.1mol/L. Calibrate and calculate according to the following methods:

a) Calibration: Weigh about 0.3g of anhydrous sodium pyrophosphate, to the nearest of 0.0002g. Place in a 250mL beaker. Add 50mL of carbon dioxide-free water to dissolve. While stirring, add hydrochloric acid solution in drops (when the pH is close to 3.8, appropriately dilute part of the hydrochloric acid solution with water) to adjust the pH of the solution to 3.8. Then follow the steps described in A.3.4, start calibration from "Add 25mL of zinc sulfate solution...";

b) Each milliliter of sodium hydroxide standard titration solution is equivalent to the number of grams of disodium dihydrogen pyrophosphate ρ calculated according to formula (A.1).

$$\rho = \frac{0.834\ 5 \times m}{V} \qquad \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots (A.1)$$

Where,

0.8345 - The coefficient of sodium pyrophosphate converted to disodium dihydrogen pyrophosphate;

m - The mass of anhydrous sodium pyrophosphate, in grams (g);

V - The volume of sodium hydroxide standard titration solution consumed in calibration, in milliliters (mL).

A.3.3 Instruments and equipment

Acidity meter: The resolution is 0.02pH. It is equipped with glass electrode and saturated calomel electrode (or composite electrode).

A.3.4 Analysis steps

Weigh about 0.3g of specimen, to the nearest of 0.0002g. Place in a 150mL beaker. Add 50mL of carbon dioxide-free water. Heat to completely dissolve the specimen. After cooling to the room temperature, use hydrochloric acid solution on the pH meter (when the pH is close to 3.8, properly dilute part of the hydrochloric acid solution with water) to adjust the pH of the solution to 3.8. Add 25mL of zinc sulfate solution. Stir 3min. While stirring, use sodium hydroxide standard titration solution to titrate till the pH of solution is 3.8, which shall be the end point.

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