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NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

GB 1886.337-2021

**National food safety standard - Food additives -
Potassium dihydrogen phosphate**

食品安全国家标准 食品添加剂 磷酸二氢钾

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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National food safety standard - Food additives - Potassium dihydrogen phosphate

1 Scope

This Standard applies to the food additive potassium dihydrogen phosphate that is produced with potassium hydroxide and the food additive phosphoric acid (including wet-process phosphoric acid) as raw materials.

2 Molecular formula and relative molecular mass

2.1 Molecular formula

KH_2PO_4

2.2 Relative molecular mass

136.08 (according to the international relative atomic mass in 2018)

3 Technical requirements

3.1 Sensory requirements

Sensory requirements shall be in accordance with Table 1.

Table 1 – Sensory requirements

3.2 Physical and chemical indicators

Physical and chemical indicators shall be in accordance with Table 2.

Table 2 – Physical and chemical indicators

Appendix A

Inspection method

WARNING: Some reagents which are used in the test method of this Standard are toxic or corrosive; appropriate safety and protective measures shall be taken during operation. When necessary, it shall be carried out in a fume hood. If it is splashed on the skin, use water to rinse it immediately. If it is serious, seek medical attention immediately.

A.1 General provisions

The reagents and water that are used in this Standard, when no other requirements are specified, refer to analytical reagents and grade-III water which is specified in GB/T 6682. The standard solutions, preparations and products for impurity determination, which are used in the test, are all prepared in accordance with the provisions of GB/T 601, GB/T 602, and GB/T 603, when no other requirements are specified. The used solution, if not indicated which solvent is used, refers to aqueous solution.

A.2 Identification test

A.2.1 Reagents and materials

A.2.1.1 Nitric acid solution: 1+8.

A.2.1.2 Ammonia solution: 2+3.

A.2.1.3 Silver nitrate solution: 17 g/L.

A.2.2 Identification method

A.2.2.1 Identification of phosphate radical

Weigh 1.0 g of the sample; dissolve it in 20 mL of water; add silver nitrate solution, to produce a yellow precipitate. This precipitate is soluble in ammonia solution or nitric acid solution.

A.2.2.2 Potassium ion identification

Weigh 1 g of the sample; add 20 mL of water to dissolve. Dip a platinum wire ring in hydrochloric acid; burn it to colorless on the flame. Dip the test solution and burn it on the flame. The flame shall be purple when viewed with cobalt glass.

Calculate the volume (V_1) of the hydrochloric acid standard titration solution that is consumed by the sample according to Formula (A.1).

$$V_1 = \frac{5.0 \times c_1 - V \times c_2}{c_1} \dots\dots\dots (A.1)$$

Where:

5.0 – volume of the added hydrochloric acid standard titration solution, in milliliters (mL);

c_1 – concentration of the hydrochloric acid standard titration solution, in moles per liter (mol/L);

V – volume of sodium hydroxide standard titration solution that is consumed when the sudden jump occurs at $\text{pH} \approx 4.0$, in milliliters (mL);

c_2 – concentration of the sodium hydroxide standard titration solution, in moles per liter (mol/L);

When $V_1 < 0$, the mass fraction w_1 of potassium dihydrogen phosphate (KH_2PO_4) is calculated according to Formula (A.2).

$$w_1 = \frac{V_2 \times c_2 \times M \times 10^{-3}}{m_1} \times 100\% \dots\dots\dots (A.2)$$

When $V_1 \geq 0$, the mass fraction w_1 of potassium dihydrogen phosphate (KH_2PO_4) is calculated according to Formula (A.3).

$$w_1 = \frac{(V_2 \times c_2 - V_1 \times c_1) \times M \times 10^{-3}}{m_1} \times 100\% \dots\dots\dots (A.3)$$

Where:

V_2 – volume of sodium hydroxide standard titration solution that is consumed in titration between $\text{pH} \approx 4.0$ and $\text{pH} \approx 8.8$, in milliliters (mL);

c_2 – concentration of the sodium hydroxide standard titration solution, in moles per liter (mol/L);

M – molar mass of potassium dihydrogen phosphate (KH_2PO_4), in grams per mole (g/mol) ($M = 136.08$);

10^{-3} – conversion factor;

m_1 – mass of the sample, in grams (g);

A.5.1.2 Electrothermal constant-temperature dry box: The temperature control range is $105\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$.

A.5.2 Analysis steps

Weigh about 10 g of the sample, accurate to 0.01 g; place it in a 400 mL beaker; add 100 mL of water and heat it to boil; while it is hot, use a glass sand crucible, which has been pre-heated in an electrothermal constant-temperature dry box at $105\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ to constant mass, for suction filtration; use 200 mL of hot water to wash the water-insoluble matter 10 times. Put the glass sand crucible, together with the water-insoluble matter, in an electrothermal constant-temperature dry box at $105\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ until the mass is constant.

A.5.3 Result calculation

Calculate the mass fraction w_3 of the water insoluble matter according to Formula (A.5).

$$w_3 = \frac{m_4 - m_5}{m_6} \times 100\% \quad \dots\dots\dots (A.5)$$

Where:

m_4 – mass of the water insoluble matter and the glass sand crucible, in grams (g);

m_5 – mass of the glass sand crucible, in grams (g);

m_6 – sample mass, in grams (g).

The test result is based on the arithmetic mean of the parallel determination results. The absolute difference between two independent determination results that are obtained under repeatability conditions is not more than 0.002%.

A.6 Determination of pH (10 g/L solution)

A.6.1 Reagents and materials

Carbon dioxide-free water.

A.6.2 Instruments and apparatuses

Acidity meter: resolution of 0.01 pH, equipped with glass electrode and saturated calomel electrode (or composite electrode).

A.6.3 Analysis steps

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