



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 1886.334-2021

**National food safety standard - Food additives - Dipotassium
hydrogen phosphate**

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1 Scope

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

2.1 Molecular formula

Dipotassium hydrogen phosphate anhydrous: K_2HPO_4 Dipotassium hydrogen phosphate trihydrate: $\text{K}_2\text{HPO}_4 \cdot 3\text{H}_2\text{O}$

2.2 Relative Molecular Mass

Dipotassium hydrogen phosphate anhydrous: 174.17 (as per 2018 international atomic mass)

Dipotassium hydrogen phosphate trihydrate: 228.22 (as per 2018 international atomic mass)

3.1 Sensory requirements

The sensory requirements shall comply with the provisions of Table 1.

Table 1 - Sensory Requirements

Appendix A Inspection Methods

Caution: Some reagents used in this test method are toxic or corrosive, so please be careful to take appropriate safety and protection measures when operating! If necessary, perform it in a fume hood. If it splashes on the skin, it shall be rinsed with water immediately, and the severe cases shall be treated immediately.

A.1 General provisions If no other requirements are specified, all the reagents and water used in this Standard refer to the analytical reagents and Class-III water specified in GB/T

6682. If no other requirements are specified, standard solution for determining the impurity, preparation and product used in the test shall be prepared according to the provisions of GB/T 601,

GB/T 602, GB/T 603. The solution used in the test refers to the aqueous solution when the solvent is not specified.

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: 17g/L.

A.2.2 Identification method A.2.2.1 Identification of phosphate radical Weigh about 1.0g of specimen; dissolve it in 20mL of water; adjust to neutral with nitric acid solution. Add silver nitrate solution to produce yellow precipitate, which is soluble in ammonia solution or nitric acid solution.

A.2.2.2 Identification of potassium ions Weigh 1g of specimen; add 20mL of water to dissolve. Dip a platinum wire ring in hydrochloric acid and burn it to colourless on the flame. Dip the test solution and burn it on the flame. The flame shall be purple when viewed with cobalt glass.

A.3 Determination of the content of dipotassium hydrogen phosphate (K_2HPO_4)

(on a dry basis)

Where:

40.0 - volume of the added hydrochloric acid standard titration solution, in mL;

c1 - concentration of hydrochloric acid standard titration solution, in mol/L;

V - volume of sodium hydroxide standard titration solution consumed for titration till a sudden jump point occurs at pH~4.0, in mL;

c2 - concentration of sodium hydroxide standard titration solution, in mol/L.

When , the mass fraction of dipotassium hydrogen phosphate (by $K_2HPO_4 \cdot 3H_2O$ or K_2HPO_4) w1 shall be calculated according to Formula (A.2).

When , the mass fraction of dipotassium hydrogen phosphate (by $K_2HPO_4 \cdot 3H_2O$ or K_2HPO_4) w1 shall be calculated according to Formula (A.3).

Where:

V1 - when titrating till a sudden jump point occurs at pH~4.0, volume of hydrochloric acid standard titration solution consumed by the specimen, in mL;

c1 - concentration of hydrochloric acid standard titration solution, in mol/L;

M - molar mass of dipotassium hydrogen phosphate (by K_2HPO_4), in g/mol ($M=174.17$);

10-3 - conversion factor;

m1 - mass of specimen, in g;

V2 - volume of sodium hydroxide standard titration solution consumed for titration at pH~4.0 to pH~8.8, in mL;

c2 - concentration of sodium hydroxide standard titration solution, in mol/L.

The test results are based on the arithmetic mean of the parallel determination results.

The absolute difference between two independent determination results obtained under repeatability conditions is no more than 0.2%.

A.4 Determination of loss on drying mL of water and heat it to a boil. While it is hot, filter by the glass sand crucible pre-baked in an electric heating constant temperature drying oven at $105^{\circ}C \pm 2^{\circ}C$. Wash the water-insoluble matter for 10 times by 200mL of hot water. Put the glass sand crucible together with the water-insoluble matter in a $105^{\circ}C \pm 2^{\circ}C$ electric heating constant temperature drying box until the mass is constant.

A.5.3 Calculation of results The mass fraction w3 of water-insoluble matter is calculated according to Formula (A.5).

Where:

m4 - mass of water-insoluble matter and glass sand crucible, in g;

m5 - mass of glass sand crucible, in g;

m6 - mass of specimen, in g;

w2 - mass fraction of loss on drying measured according to A.4, in %.

The test results are based on the arithmetic mean of the parallel determination results.

The absolute difference between two independent determination results obtained under repeatability conditions is no more than 0.002%.

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

A.6.1 Reagents and materials Carbon dioxide-free water.

A.6.2 Apparatus Acidity meter: Resolution of 0.01pH, equipped with glass electrode and saturated calomel electrode (or composite electrode).

A.6.3 Analysis procedures Weigh $1.00g \pm 0.01g$ of specimen; place it in a 100mL beaker; dissolve it with carbon dioxide-free water; transfer it into a 100mL volumetric flask. Dilute to the mark with carbon dioxide-free water; and shake it well. Pour into a 100mL dry beaker; and measure the pH of the specimen solution with a calibrated acidity meter.

The test results are based on the arithmetic mean of the parallel determination results.

The absolute difference between two independent determination results obtained under repeatability conditions is no more than 0.1%.

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