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NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

GB 1903.48-2020

**National Food Safety Standard - Food nutrition
enhancer - Magnesium hydrogen phosphate**

食品安全国家标准 食品营养强化剂 磷酸氢镁

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National Food Safety Standard - Food nutrition enhancer - Magnesium hydrogen phosphate

1 Scope

This Standard is applicable to the food nutrition enhancer - magnesium hydrogen phosphate that is obtained by chemical synthesis and refining with food additives - phosphoric acid and magnesium oxide or magnesium hydroxide or magnesium carbonate.

2 Chemical name, molecular formula and relative molecular mass

2.1 Chemical name

Magnesium hydrogen phosphate trihydrate

2.2 Molecular formula

$\text{MgHPO}_4 \cdot 3\text{H}_2\text{O}$

2.3 Relative molecular mass

174.33 (according to 2018 international relative atomic mass)

3 Technical requirements

3.1 Sensory requirements

Sensory requirements shall comply with the provisions of Table 1.

3.2 Physical and chemical indicators

Annex A

Test methods

A.1 General

Unless otherwise specified, the reagents and water used in this Standard refer to analytical reagents and grade 3 water specified in GB/T 6682. Unless otherwise specified, the standard titration solutions used in the test, the standard solutions, preparations and products used in the determination of impurities are prepared according to the provisions of GB/T 601, GB/T 602 and GB/T 603. When the solution used in the test does not indicate which solvent is used for preparation, it refers to aqueous solution.

A.2 Identification test

A.2.1 Reagents and materials

A.2.1.1 Ethanol.

A.2.1.2 Ammonia solution: 2 + 3.

A.2.1.3 Nitric acid solution: 1 + 9.

A.2.1.4 Disodium hydrogen phosphate solution: WEIGH 12 g of disodium hydrogen phosphate; DISSOLVE in 100 mL of water.

A.2.1.5 Ammonium molybdate solution: TAKE 6.5 g of powdered molybdic acid; DISSOLVE in a mixture of 14 mL of water and 14.5 mL of ammonia; COOL; slowly ADD it to the pre-cooled mixture of 32 mL of nitric acid and 40 mL of water under stirring; LEAVE it for 48 h. PERFORM suction filtration and STORE the filtrate in a dark place. The solution will deteriorate and become ineffective when stored for a long time. When adding 2 mL of disodium hydrogen phosphate solution to 5 mL of the above solution and it does not immediately produce a large amount of yellow precipitate, the solution is ineffective.

A.2.1.6 Acetic acid solution: 6 %.

A.2.1.7 Ferric chloride solution: 90 g/L. WEIGH 9 g of ferric chloride ($\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$); ADD water to dissolve it to 100 mL.

A.2.1.8 Ammonium chloride solution: 100 g/L. WEIGH 10.5 g of ammonium chloride (NH_4Cl); ADD water to dissolve it to 100 mL.

A.2.1.9 Ammonium carbonate solution: 200 g/L. WEIGH 20 g of ammonium carbonate; DISSOLVE it in water; ADD 20 mL of ammonia; DILUTE to 100 mL

with water.

A.2.1.10 Anhydrous trisodium phosphate solution: 60 g/L.

A.2.2 Identification method

A.2.2.1 Solubility

Slightly soluble in water, soluble in dilute acid, but insoluble in ethanol.

A.2.2.2 Identification of phosphate

WEIGH about 0.2 g of sample; DISSOLVE it in 10 mL of nitric acid solution; ADD ammonium molybdate solution dropwise. It produces green-yellow precipitation, which can be dissolved in aqueous ammonia.

A.2.2.3 Identification of magnesium ions

WEIGH about 0.1 g of sample; DISSOLVE it in 0.5 mL of acetic acid solution and 20 mL of water; ADD 1 mL of ferric chloride solution; LET it stand for 5 min and then FILTER. ADD 0.5 mL of ammonium chloride solution and 0.5 mL of ammonium carbonate solution to the filtrate, STIR, no precipitation occurs; then ADD 0.5 mL of anhydrous trisodium phosphate solution, it produces white crystal precipitation; ADD 1.0 mL of ammonia solution, the white crystal precipitation does not dissolve.

A.3 Determination of content [calculated as magnesium pyrophosphate ($\text{Mg}_2\text{P}_2\text{O}_7$)]

A.3.1 Method summary

In the sample solution, DROP disodium ethylenediaminetetraacetic acid standard titration solution to near the end point, ADJUST the pH of the sample solution to be within the coloring pH range of chrome black T indicator with sodium hydroxide solution, and continue to TITRATE the remaining magnesium.

A.3.2 Reagents and materials

A.3.2.1 Hydrochloric acid.

A.3.2.2 Ammonia-ammonium chloride buffer solution: pH $\approx$ 10.

A.3.2.3 Sodium hydroxide solution: 43 g/L. WEIGH 4.3 g of sodium hydroxide; DISSOLVE and DILUTE to 100 mL with water.

A.3.2.4 Disodium ethylenediaminetetraacetic acid standard titration solution: $c(\text{EDTA}) = 0.1 \text{ mol/L}$.

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