national standards of People's Republic of China

GB XXXXX—XXXX

National food safety standards

Food nutrition enhancer magnesium hydrogen phosphate

(draft for comments)

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Food nutrition enhancer magnesium hydrogen phosphate

1 Scope

This standard applies to the food additive phosphoric acid and magnesium oxide or magnesium hydroxide or magnesium carbonate as raw materia
The food nutrition enhancer magnesium hydrogen phosphate obtained.

2 Chemical name, molecular formula and relative molecular mass

2.1 Chemical Name

Magnesium hydrogen phosphate trihydrate

2.2 Molecular formula

$MgHPO_4 \cdot 3H_2O$

2.3 Relative molecular mass

174.33 (according to 2016 international relative atomic mass)

3 Technical requirements

3.1 Sensory requirements

Sensory requirements should be in accordance with Table 1.

Table 1 Sensory requirements

item Head	Want begging	Testing method
Color	white	Take an appropriate amount of sample in a clean, dry white porcelain dish under natural ligl Observe its color, state, smell its smell
State	Crystalline powder	
Gas smell	Odorless	

3.2 Physical and chemical indicators

Physical and chemical indicators should meet the requirements of Table 2.

Table 2 Physical and chemical indicators

item Head	Means	Standard	Testing method
Content [calculated as magnesium pyrophosphate ($Mg_2P_2O_7$)], *w* /%	≥	96.0	Appendix A, A.3
Burning reduction, *w* /%		29.0~36.5	Appendix A, A.4
Fluoride (in F) / (mg / kg)	≤	25	GB / T 5009.18 fluoride ion selective electrode method
Lead (Pb) / (mg / kg)	≤	2.0	GB 5009.12
Total arsenic (as As) / (mg/kg)	≤	3.0	GB 5009.76 or GB 5009.11

Appendix A

Testing method

A.1 General provisions

The reagents and water used in this standard refer to the analytical reagents and the tertiary water specified in GB/T 6682 when no other requireme
The standard solution used in the test, the standard solution for the determination of impurities, the preparation and its products, according to other requ

Prepared according to the provisions of GB/T 602 and GB/T 603.
The solution used in the test refers to an aqueous solution when it is not indicated which solvent is used.

A.2 Identification test

A.2.1 Reagents and materials

A.2.1.1 Ethanol.

A.2.1.2 Silver nitrate solution: 17g / L.

A.2.1.3 Ammonia solution: 2+3.

A.2.1.4 Nitric acid solution: 1+9.

A.2.1.5 Ammonium molybdate solution: Take 6.5 g of powdered molybdic acid, dissolved in 14 mL of water and 14.5 mL of ammonia solution, cooled
Slowly add to a pre-cooled mixture of 32 mL nitric acid and 40 mL water for 48 h. Filtered and the filtrate was stored in the dark. The solution
The long-term deterioration will fail. When 2 mL of sodium phosphate is added to 5 mL of the above solution, a large amount of yellow precipitate is n

A.2.1.6 Acetic acid solution: 6% (volume fraction).

A.2.1.7 Ferric chloride solution: 90 g / L. Weigh 9 g of ferric chloride ($FeCl_3 \cdot 6H_2O$) and 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) and add water to dissolve to 100 mL.

A.2.1.9 Ammonium carbonate solution: 200 g/L.
Weigh 20g of ammonium carbonate, dissolve in water, add 20mL of ammonia water, and dilute to 100mL 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 the sample, dissolve it in 10 mL of nitric acid solution, and add ammonium molybdate solution dropwise to produce a greeni
Dissolved in aqueous ammonia solution.

A.2.2.3 Identification of magnesium ions

Weigh about 0.1 g of sample, dissolve in 0.5 mL of acetic acid solution and 20 mL of water, add 1 mL of ferric chloride solution, let stand for 5 mi
filter.
Add 0.5 mL of ammonium chloride solution and 0.5 mL of ammonium carbonate solution to the filtrate, stir, no precipitation, and then add 0.5 mL of a
The trisodium phosphate solution produced a white crystal precipitate, and 1.0 mL of an aqueous ammonia solution was added thereto, and the white cr

A.3 content [measured by magnesium pyrophosphate ($Mg_2P_2O_7$)]

A.3.1 Method summary

In the test solution, add the standard titration solution of disodium edetate to the near end point, and adjust the pH of the test solution with sodium
The remaining magnesium is continuously titrated over the chrome black T indicator coloring pH range.

A.3.2 Reagents and materials

A.3.2.1 Hydrochloric acid.

A.3.2.2 Ammonia-ammonium chloride buffer solution: pH ≈10.

A.3.2.3 Sodium hydroxide solution: 43 g/L: Weigh 4.3 g of sodium hydroxide and dilute to 100 mL with water.

A.3.2.4 Standard titration solution of disodium edetate: *c* (EDTA) = 0.1 mo1/L.

A.3.2.5 Chrome black T indicator liquid: 5g / L.

A.3.3 Analysis steps

Weigh approximately 0.5 g of sample (A.4 residue obtained in the determination of ignition loss) to the nearest 0.0001 g, add 50 mL of water and 1
Dissolve by heating; after cooling, dilute to 100 mL with water and mix.
Take 50 mL of this solution, place it in a 400 mL beaker, add 100 mL of water,
Heat to 55° C ~ 60 ° C, add 15 mL of Ethylenediaminetetraacetic acid standard titration solution with a burette, stir constantly with a magnetic stir bar,
Adjust the pH to 10 with sodium hydroxide solution, add 10 mL ammonia-ammonium chloride buffer solution and a few drops of chrome black T indic
The standard titration solution of disodium tetraacetate was titrated until the wine red became pure blue. A blank test was also performed.

A.3.4 Calculation of results

The mass fraction $w_{1\,of\,the}$ content [calculated as magnesium pyrophosphate ($Mg_2P_2O_7$)] is calculated according to the formula (A.1):

$$w_1 = \frac{(V_1 - V_0) \times c_1 \times M_1 \times 100\%}{m_1 \times \frac{50}{100} \times 1000} \quad \text{.....(A.1)}$$

In the formula:

V_1 - the volume of the standard titration solution of disodium edetate consumed by the titration sample solution, in milliliters (mL);

V_0 - the volume of the standard titration solution of disodium edetate consumed by the blank solution, in milliliters (mL);

c_1 - the concentration of the standard titration solution of disodium edetate, in units of moles per liter (mol / L);

M_1 - the molar mass of magnesium pyrophosphate in grams per mole (g/mol), [$M(\frac{1}{2}Mg_2P_2O_7)$=111.28];

m_1 - the mass of the sample in grams (g);

50——removing the volume of the sample solution in milliliters (mL);

100——the volume of the sample solution to be volume, in milliliters (mL);

1000 - conversion factor.

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

Absolute difference between two independent determinations obtained under repeatability conditions The value is not more than 0.3%.

A.4 Determination of ignition loss

A.4.1 Instruments and equipment

A.4.1.1 High temperature furnace: The temperature can be controlled at 800 °C ± 25 °C.

A.4.1.2 Porcelain crucible: 30 mL.

A.4.2 Analysis steps

Weigh about 1 g of sample, accurate to 0.0002 g, and place it in a porcelain crucible that has been burned to constant weight at 800 °C ± 25 °C at 8 The high temperature furnace burns to constant weight.

A.4.3 Calculation of results

The mass fraction w_2 of the ignition loss is calculated according to the formula (A.2):

$$w_2 = \frac{m_2 - m_3}{m_4} \times 100\% \quad \text{.....(A.2)}$$

In the formula:

m_2 ——the mass of the porcelain crucible and the sample before burning, in grams (g);

m_3 ——the mass of the porcelain crucible and the sample after burning, in grams (g);

m_4 - the mass of the sample in grams (g).

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

Absolute difference between two independent determinations obtained under repeatability conditions Not more than 0.2%.

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