



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

GB 1886.250-2016

National food safety standard - Food additives - Sodium Phytate

食品安全国家标准 食品添加剂 植酸钠

(English Translation)

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1 Scope

This Standard is applicable to food additive sodium phytate, which is made from rice bran and corn germ as the raw materials, and through extraction, purification, crystallization separation and drying.

2 Molecular Formula, Structural Formula and Relative

Molecular Mass

2.1 Molecular Formula

$C_6H_6O_{24}P_6Na_{12}$

2.3 Relative Molecular Mass

923.8012 (in accordance with 2013 international relative atomic mass)

3.1 Sensory Requirements

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

Appendix A

Inspection Method

A.1 General Rules

When other requirements are not indicated, the reagents and water used in this

Standard refer to analytically pure reagents and Grade-3 water specified in GB/T 6682.

When other requirements are not indicated, the standard solutions, preparations and products used for impurity determination shall be prepared in accordance with the stipulations of GB/T 602 and GB/T 603. When it is not specified which solvent is used for the preparation, the solutions used in the test refer to aqueous solutions.

A.2.2 Identification method

Take a small amount of 1% specimen solution; use nitric acid solution to neutralize it; add a few drops of calcium chloride solution to generate white precipitate.

Take a small amount of 1% specimen solution; add 1 mL of sulfuric acid; heat it up to reach complete carbonization. Then, dropwise add hydrogen peroxide, until it turns light yellow and translucent; add ammonium molybdate solution to develop yellow.

A.3.2 Reagents and materials

A.3.2.1 Nitric acid.

A.3.2.2 Perchloric acid.

A.3.2.3 Nitric acid solution. 1 + 1.

A.3.2.4 Quin molybdenum ketone reagent. weigh-take 70 g of sodium molybdate, add

150 mL of water to dissolve it, which is solution I; weigh-take 60 g of citric acid, add 150 mL of water and 85 mL of nitric acid to dissolve it, then, under stirring, pour solution I into it, which is solution II. Measure-take 100 mL of water, add 35 mL of nitric acid and 5 mL of quinoline; slowly pour the mixed solution into solution II, let it stand for 24 h, then, filter it into a 1 L volumetric flask; add 280 mL of acetone, use water to dilute to the scale; after mixing it up, store it in a plastic bottle; it shall be valid for half a year.

A.3.2.5 No. 5 sand core funnel.

A.3.4 Result calculation

The mass fraction w_1 of sodium phytate shall be calculated in accordance with Formula (A.1).

A.4.1 Method summary

Under acidic conditions, add orthophosphate in the sodium phytate solution of ferric chloride solution to generate yellow phosphorus vanadium molybdate complex with vanadium molybdate. Use a spectrophotometer to measure its absorbance value at 420 nm. In accordance with the standard curve, calculate the inorganic phosphorus content in the sample.

A.4.2.1 Ammonium vanadium molybdate solution. weigh-take 40 g of ammonium

molybdate $[(\text{NH}_4)_6\text{Mo}_7\text{O}_{24} \cdot 4\text{H}_2\text{O}]$, dissolve it in 400 mL of water to obtain solution A.

Weigh-take 1.0 g of ammonium metavanadate (NH_4VO_3) , dissolve it in a mixed solvent of 300 mL of water and 80 mL of concentrated sulfuric acid to obtain solution B. Add solution A to solution B; use reagent water to dilute it to 1 L.

A.4.2.2 Ferric chloride solution. 10 g/L.

A.4.3 Instrument and equipment

Spectrophotometer

A.4.4.1 Determination

Weigh-take about 1 g of the specimen, accurate to 0.001 g; add 20 mL of water to dissolve it. Add 2 mL of ferric chloride solution; add water to reach a constant volume of 50 mL. At 10 °C and 7,500 r/min, centrifuge it for 5 min. Take 5 mL of the supernatant;

add 15 mL of water and 10 mL of ammonium vanadium molybdate solution, shake it well. Let it stand for 2 min, then, at 420 nm, measure its absorbance.

A.5.1 Method summary

Under acidic conditions, the chloride ions in the sodium phytate solution and the silver nitrate solution generate white silver nitrate precipitate. Use the visual inspection method to compare the turbidity with the standard solution.

A.5.2 Reagents and materials

A.5.2.1 Nitric acid solution. 1 + 4.

A.5.2.2 Silver nitrate solution. 0.1 mol/L.

A.5.2.3 Chloride standard solution. 0.1 mg/mL.

A.6.1 Method summary

Under acidic conditions, the sulfate ions in the sodium phytate solution and the barium chloride solution generate barium sulfate precipitate. Use the visual inspection method to compare the turbidity with the standard solution.

A.6.2 Reagents and materials

A.6.2.1 Nitric acid solution. 1 + 3.

A.6.2.2 Sulfate standard solution. 0.1 mg/mL.

A.6.3 Analytical procedures

Weigh-take 1.0 g of the specimen (accurate to 0.01 g); place it in a 25 mL colorimetric tube. Add 20 mL of water, then, use nitric acid solution to neutralize it to pH = 7; the remaining shall be carried out in accordance with the stipulations of GB/T 9728. Take

1.0 mL of sulfate standard solution to a 25 mL colorimetric tube; add 20 mL of water;

the rest of the steps are the same as the treatment of the specimen solution. Observe the turbidity of the sample, which shall not be deeper than the standard solution.

A.7.1 Method summary

In acetic acid medium, trace calcium ions and oxalate ions generate suspension of calcium oxalate, which is insoluble. Use the visual inspection method to compare the turbidity with the standard solution.

A.7.2 Reagents and materials

A.7.2.1 Acetic acid solution.

A.7.3 Analytical procedures

Weigh-take 1.0 g of the specimen, accurate to 0.01 g; place it in a 25 mL colorimetric tube. Add 10 mL of water; use nitric acid solution to neutralize it to pH = 7. Add 1 mL of acetic acid and 5 mL of ammonium oxalate solution; use water to dilute to the scale;

let it stand for 10 min. Take 1.0 mL of calcium standard solution to a 25 mL colorimetric tube; add 10 mL of water. The rest of the steps are the same as the treatment of the specimen solution. Observe the turbidity of the sample, which shall not be deeper than the standard solution.

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