



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

GB 1886.237-2016

**National Food Safety Standard -- Food Additives -- Phytic acid
(also known as phytic acid)**

食品安全国家标准 食品添加剂 植酸（又名肌醇六磷酸）

(English Translation)

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1 Scope

This standard applies to plant rice bran, corn and other raw materials, chemical extraction methods, purified, concentrated food additive prepared phytic acid (Also known as phytic acid).

2 Formula, Structure and molecular weight

Formula 2.1

C₆H₁₈O₂₄P₆

2.3 Molecular Weight

660.02 (according to 2013 international relative atomic mass)

3.1 Sensory requirements

Sensory requirements shall comply with the requirements in Table 1.

Table 1 Sensory requirements

Project requires test methods Light yellow or light brown color Viscous liquid state Proper amount of sample is placed in a clean, dry glassware, under natural light Observe the color, the line state

3.2 Physical and Chemical Indicators

Physical and chemical indicators should be consistent with the provisions of Table 2.

Table 2. Physical and chemical indicators

Item Index Test Method Phytic acid content, w /% >= 50 Appendix A A.3 Inorganic

phosphorus, w /% ≤ 0.02 Appendix A A.4 Chloride (based on Cl), w /% ≤ 0.02 A.5 Appendix A Sulfate (in terms of SO₄), w /% ≤ 0.02 Appendix A A.6 Calcium (Ca in meter), w /% ≤ 0.02 A.7 Appendix A Arsenic (As)/(mg/kg) ≤ 3.0 GB 5009.76 Lead (Pb)/(mg/kg) ≤ 1.0 GB 5009.75 Appendix A Testing method A.1 General Provisions this standard reagent in the absence of water and other requirements stated, refer to three analytical reagent water and GB/T 6682 provisions. Reagents Used in the standard solution, the standard solution, the determination of impurities, formulations and products, in the absence of other requirements specified are by GB/T 601, GB/T 602, GB/T 603 of the predetermined prepared. The test does not indicate when the solution which is formulated with a solvent, refer to the aqueous solution.

A.2 Identification Test A.2.1 Reagents and materials A.2.1.1 sulfuric acid.

A.2.1.2 hydrogen peroxide.

Ammonia solution A.2.1.3. 23.

Calcium chloride solution A.2.1.4. 75g/L.

A.2.1.5 ammonium molybdate solution. 25g/L.

A.2.2 precipitation test Take a sample amount, with aqueous ammonia solution, calcium chloride solution was added dropwise number, i.e., a white precipitate appeared.

A.2.3 color test

Sample taken 0.2g, 1mL of sulfuric acid was added and heated to completely carbonized, hydrogen peroxide was added dropwise to the colorless and transparent, i.e., significant ammonium molybdate solution was added yellow.

A.3 Determination of Phytic Acid A.3.1 Method summary Perchloric acid and phytic acid by nitric acid digestion generated in the nitric acid, phosphoric acid and quimociac phosphomolybdic acid reagent to quinoline yellow the precipitate by filtration, washed, dried and weighed to calculate the phytic acid content in the samples.

A.3.2 Reagents and materials A.3.2.1 nitric acid.

A.3.2.2 nitric acid solution. 11.

A.3.2.3 quimociac reagent. Weigh 70g of sodium molybdate was dissolved was added 150mL of water, a solution I, weighed 60g water was added 150mL citrate 85mL and nitrate were dissolved under stirring the solution was poured into I wherein a solution II; the amount of water 100mL, 35mL of nitric acid was added and quinoline 5mL, the mixture was slowly poured into solution II placed 24h, filtered in a 1L volumetric flask, diluted with 280 mL of acetone, water to Scale, stored in a plastic bottle after mixing, valid for six months.

A.3.3 Instruments and Equipment Frit glass funnel or crucible. G5, filter pore size 2μm ~ 4μm40mL.

A.3.4 Analysis step

About 0.3 g of sample was weighed (accurate to 0.0002g), placed in 300mL Erlenmeyer flask, add 10mL of nitric acid, perchloric acid 5mL, ventilation it built on the electric heating cabinet, gradually increasing the temperature until the solution became clear white smoke escaping nearly dry, cool. Rinse the bottle wall with a small amount of water, which was quantitatively transferred Move 100mL volumetric flask, dilute to the mark with water for solution A.

A20mL amount of the solution in 300mL conical flask, add 80 mL of water, nitric acid solution and 10mL quimociac reagent 50mL, Aging heated in boiling water until a clear solution was cooled to room temperature. In decantation filtered on a suction filtration apparatus, the precipitate was quantitatively transferred to a constant weight Frit glass funnel, the precipitate was washed several times with a small amount of water, and the funnel was placed in an oven dried 1h $120^{\circ}\text{C} \pm 2^{\circ}\text{C}$, cooled in a desiccator to room temperature, weigh.

A.3.5 calculation results Phytic acid ($\text{C}_6\text{H}_{18}\text{O}_{24}\text{P}_6$) mass fraction w , according to equation (A.1) is calculated.

$m_1 \times 0.01400 \times 3.552 \ m_2 \times x \ 100\%$ (A.1) where.

Mass M_1 --- precipitate in grams (G);

--- conversion factor 0.01400 Quinoline phosphomolybdate to phosphorus;

--- 3.552 conversion factor phytic acid phosphorous;

--- M_2 mass of sample, grams (G);

20 --- test sample volume of the solution;

The total volume of the sample solution 100 ---.

The results obtained are reserved to a decimal.

Take two parallel arithmetic mean of the measurement results of the measurement results, the absolute difference determination results parallel to not more than 0.3%.

Determination of inorganic phosphorus A.4 A.4.1 Method summary Phosphomolybdate blue method. Under certain acidity and the presence of a reducing agent, the phytic acid solution of phosphomolybdic free phosphate generated is reduced to the yellow phosphomolybdic blue. Colorimetric determination of the limit value of the inorganic phosphorus visually.

A.4.2 Reagents and materials Ammonia solution A.4.2.1. 23.

Sulfuric acid solution A.4.2.2. 16.

A.4.2.3 ammonium molybdate solution. 25g/L.

A.4.2.4 ascorbic acid solution. 100g/L, using now.

Phosphorus standard solution A.4.2.5. 1mL containing 0.01mgP. Take 0.439g of potassium dihydrogen phosphate, soluble in water, into 1000mL volumetric flask, Dilute to volume, the solution was diluted 10-fold when used.

A.4.3 Analysis step

0.1 g of a sample was weighed (accurate to 0.01g), was placed 25mL colorimetric tube, adding water 5mL, neutralized with aqueous ammonia solution to pH = 7 (pH Dipstick test). 1mL solution of sulfuric acid, ammonium molybdate solution 1mL, 1mL dilute ascorbic acid solution, water to the mark, Yu Bing bath (0 °C ~ After the 5 °C) placed 30min, visual colorimetric. The sample was not deeper than the blue limits.

Limits is taken phosphorus standard solution (1 mL containing 0.01mgP) 2.0mL, water was added to 5mL, the sample solution and the same treatment.

A.5 Determination of chlorides A.5.1 Reagents and materials Ammonia solution. 23.

A.5.2 Analysis step

0.5g sample was weighed (accurate to 0.01g), was placed 25mL colorimetric tube, adding water 20mL, neutralized with aqueous ammonia solution to pH = 7 (pH Dipstick test). Remaining in accordance with the provisions of GB/T 9729's.

Limits is taken chloride standard solution (1 mL containing 0.1mgCl) 1.0mL water was added to 20mL, and similarly the sample solution deal with.

Determination sulfate A.6 Standard.

Limits is to take a calcium standard solution (1 mL containing 0.1mgCa) 1.0mL, water was added to 10mL, and the same treatment of the sample solution.