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

GB 29934-2013

Food additive -- Aluminum starch octenyl succinate

食品添加剂 辛烯基琥珀酸铝淀粉

(English Translation)

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Table of Contents

- 1 Scope
- 2 Technical Requirements
 - 2.1 Raw materials
 - 2.2 Sensory requirements
 - 2.3 Physical indicators

1 Scope

This standard applies to edible starch or arrowroot starch produced by a starch raw milk as a raw material obtained with octenyl succinic anhydride and sulfuric acid Reaction of aluminum food additives aluminum starch octenyl succinate, and the combination of enzymatic treatment, acid treatment, alkali treatment, bleaching treatment and pre-paste Food processing in one or more additives processed aluminum octenyl succinate starch.

2.1.1 Raw materials

Food starch should be consistent with national standards or industry standards-related products.

2.1.2 Accessories

2.1.2.1

should meet the national standards or industry standards or the relevant provisions of the relevant requirements of the product.

2.1.2.2

reagent type and amount.

- a) octenyl succinic anhydride, dry starch is not more than 2% of the mass fraction;
- b) aluminum sulfate, less than 2% by mass of dry starch.

2.2 Sensory requirements

Sensory requirements shall comply with the requirements of Table 1.

Table 1 Sensory requirements

Project requires test methods Color white, white or light yellow Take 50 g sample in a clean white porcelain dish, under natural light, observation its color, state, smell the smell Status

granular, flaked or without visible impurities Inherent odor product smell, no odor

2.3 Physical indicators

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

Table 2. Physical and chemical indicators

Item Index Test Method Loss on drying, w /% Cereal starch ≤ 15.0 GB/T 12087 other monomers starch ≤ 18.0 Potato starch ≤ 21.0 Total arsenic (As)/(mg/kg) ≤ 0.5 GB/T 5009.11 Lead (Pb)/(mg/kg) ≤ 1.0 GB 5009.12 Sulfur dioxide/(mg/kg) ≤ 30 GB/T 22427.13 Octenyl succinic acid group/(g/100g) ≤ 3.0 Appendix A A.4 Appendix A Testing method A.1 Safety Tips Reagents The standard test methods used for toxic or corrosive, the operation should be careful! As splashed on the skin should stand that is rinsed with water, severe cases should be treated immediately.

A.2 General Provisions Unless otherwise indicated in the analysis using only recognized as analytical reagents and GB/T 6682 stipulated three water. Test Methods the standard titration solution, impurity measurement standard solution, preparations and products, did not indicate when the other requirements, according to GB/T 601, GB/T 602 and 603 of the regulations prepared GB/T ; the solution when the solvent is not specified, refer to the aqueous solution.

A.3 Identification Test A.3.1 microscopy Without pasting process to keep the grain structure octenyl succinic aluminum starch can be directly observed and verified starch particle shape through the microscope, Size and character. Under polarized light microscope, it can be observed the typical birefringence.

A.3.2 iodine staining 1 g of the sample was added 20 mL of water were suspended, several drops of iodine solution, the color should range from deep blue to reddish brown.

A.3.3 copper reduction A.3.3.1 formulated alkaline tartrate copper test solution A.3.3.1.1 Solution A. Copper Sulfate ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$) 34.66 g, should be no weathering or moisture absorption phenomenon, dissolved in water volume to 500 mL.

The solution was stored in a small sealed container.

A.3.3.1.2 Solution B. take potassium sodium tartrate ($\text{KNaC}_4\text{H}_4\text{O}_6 \cdot 4\text{H}_2\text{O}$) 173 g sodium hydroxide 50 g, dissolved in water volume to 500 mL.

The solution was stored in a small container and alkali corrosion.

A.3.3.1.3 solutions A and B mixed in equal volumes, to obtain an alkaline tartrate copper test solution.

A.3.3.2 analysis step Weigh the sample 2.5 g, placed in a flask, 0.82 mol/L hydrochloric acid solution of 10 mL of water and 70 mL, mixing, boiling water bath Was refluxed for 3 h, cooled. Take 0.5 mL solution was cooled, added 5 mL hot alkaline copper tartrate solution,

a large amount of red precipitate.

A.4 Determination of octenyl succinic group A.4.1 Principle the samples were acidified, washed, base titration. Content octenyl succinic acid group may be calculated based on alkali consumption.

A.4.2 Reagents and materials A.4.2.1 isopropanol.

A.4.2.2 hydrochloric acid.

A.4.2.3 sodium hydroxide.

A.4.2.4 silver nitrate.

A.4.2.5 isopropanol solution. Measure 90 mL of isopropanol, was added 10 mL of water, and mix.

A.4.2.6 HCl - isopropanol solution. Measure 21 mL of hydrochloric acid placed in 100 mL volumetric flask, carefully diluted with isopropyl alcohol and dilute to the mark Degree, shake.

A.4.2.7 silver nitrate solution. $c(\text{AgNO}_3) = 0.1 \text{ mol/L}$.

A.4.2.8 sodium hydroxide standard titration solution. $c(\text{NaOH}) = 0.1 \text{ mol/L}$.

A.4.2.9 phenolphthalein indicator solution. 10g/L.

A.4.2.10 Starch. not with the same modified starch of vegetable origin.

A.4.3 Instruments and Equipment Magnetic stirrer.

A.4.4 Analysis step

Weigh 5.0 g samples, accurate to 0.001 g, placed in a 150 mL beaker with a few ml of isopropanol wetted. With a pipette added 25 mL Hydrochloric acid - isopropyl alcohol solution with a sample under acid beaker wall. The sample was stirred for 30 min on a magnetic stirrer, was added 100 mL measuring cylinder Isopropanol solution was stirred 10 min. Sample solution was filtered with a Buchner funnel, and the cake was washed with isopropyl alcohol solution until the filtrate no chloride ions Sub (test with silver nitrate solution). The cake was transferred to a 600 mL beaker, and any residual starch Buchner funnel with isopropanol Wash the beaker, add water to a total volume of 300 mL. Sample stirring 10 min in a boiling water bath, add phenolphthalein indicator solution, hot hydrogen Sodium hydroxide standard titration solution titrated to a phenolphthalein endpoint. Starch (A.4.2.10) blank test.

A.4.5 Calculation Results Octenyl succinic group content $0w$, according to formula (A.1) Calculated.

0 xx

$xx = m$

$McVw$ (A.1)

Where.

Volume V_1 -- titration of sodium hydroxide solution consumed by the sample, in milliliters (mL);

V_0 -- titration volume of sodium hydroxide solution consumed in the blank, in milliliters (mL of);

C -- concentration of sodium hydroxide solution, expressed in moles per liter (mol/L);

M -- octenyl succinic anhydride molar mass in grams per mole (g/mol) [$M(C_{12}H_{18}O_3) = 210.20$];

m -- sample mass, in grams (g);

1000-- conversion factor.