



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

GB 1886.226-2016

Replacing GB 10616-2004

**National Food Safety Standard -- Food Additives -- Propylene
Glycol Alginate**

食品安全国家标准 食品添加剂 海藻酸丙二醇酯

(English Translation)

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Table of Contents

Foreword

1 Scope

2 Molecular formula and relative molecular mass

2.2 Relative molecular mass

3 Technical requirements

3.1 Sensory requirements

3.2 Physical and Chemical Indicators

Foreword

This standard replaces GB 10616-2004 "food additive propylene glycol alginate fat." this standard compared with GB 10616-2004, the main changes are as follows.

--- Standard name was changed to "national food safety standards of food additive propylene glycol alginate";

--- By the esterification index $\geq 80.0\%$ revised to $\geq 40.0\%$;

--- Remove heavy metals (Pb) project.

National Food Safety Standard Food additive propylene glycol alginate

1 Scope

This standard applies to alginic acid as the basic raw material, propylene oxide esterification obtained food additive propylene glycol alginate.

2 Molecular formula and relative molecular mass

Formula 2.1

$(C_9H_{14}O_7)_n$

2.2 Relative molecular mass

Structural units. 234.21 (according to 2011 international relative atomic mass)

3.1 Sensory requirements

Sensory requirements shall comply with the requirements of Table 1.

Table 1 Sensory requirements

Project requires test methods White or light yellow color State powder Take appropriate sample in a clean, dry plates, under natural light, mesh Color and visual observation status

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 Degree of esterification, w /% ≥ 40.0 Appendix A A.4 Insoluble ash, w /% ≤ 1.0 A.5 in Appendix A Loss on drying, w /% ≤ 20.0 A.6 in Appendix A Arsenic (As)/(mg/kg) ≤ 2.0 GB 5009.76 Lead (Pb)/(mg/kg) ≤ 5.0 GB 5009.75 Appendix A Testing method A.1 Warning Some test procedures prescribed test method can lead to dangerous situations. The operator shall take appropriate safety and health practices.

A.2 General Provisions this standard reagents and water, did not indicate when the other requirements, refer to the three water analytical reagent and GB/T 6682 regulations. test the standard solution titration experiments, impurity measurement standard solution, preparations and products, did not indicate when the other requirements, according to GB/T 601 used, Preparation of the provisions of GB/T 602 and GB/T 603; the solution was used in the experiment did not specify what kind of solvent used during the preparation, are aqueous solutions.

A.3 Identification Test A.3.1 Reagents and materials A.3.1.1 Lead acetate solution. 100g/L.

A.3.1.2 sodium hydroxide solution. 100g/L.

A.3.1.3 sulfuric acid solution. 1 -> 20.

A.3.2 Preparation of test solution Weigh about 1g sample, add 100mL water and stir to dissolve, as the test liquid to make a paste solution A.

A.3.3 Identification method A.3.3.1 Take 5mL test solution A, plus 5mL lead acetate solution immediately solidified into a jelly-like.

A.3.3.2 of 10mL test solution A, add 1mL sodium hydroxide solution, heated in water bath 5min ~ 6min, after cooling add 1mL Sulfuric acid solution immediately solidified into a jelly-like.

A.3.3.3 Take 1mL test solution A, add 4mL water, intense shaking continued to produce foam.

A.4 Determination of degree of esterification A.4.1 Method summary the mass fraction of a

degree of esterification of 100% minus the free alginic acid content mass fraction, mass fraction content of sodium alginate and insoluble Ash content and determined.

A.4.2 Calculation Results the mass fraction of a degree of esterification of w_1 , according to equation (A.1) Calculated.

$w_1 = 100\% - (w_2 + w_3 + w_4)$ (A.1) where.

w_2 --- free alginic acid content mass fraction,%;

w_3 --- alginate content mass fraction,%;

w_4 --- insoluble ash mass fraction,%.

A.4.3 Determination of free acid content of seaweed A.4.3.1 Reagents and materials

A.4.3.1.1 sodium hydroxide standard titration solution. $c(\text{NaOH}) = 0.02\text{mol/L}$.

A.4.3.1.2 phenolphthalein indicator solution. 10g/L .

A.4.3.2 analysis step Weigh about $0.5\text{g} \pm 2^\circ\text{C}$ drying 4h sample at 105°C , accurate to 0.2mg , add 200mL of freshly boiled and cooled water to dissolve, Add 3 drops of phenolphthalein indicator solution, titration with sodium hydroxide standard solution titration to pink, holding 20s does not fade as the end point.

At the same time a blank test.

A.4.3.3 Calculation Results Free alginic acid content mass fraction w_2 , according to equation (A.2) Calculated.

$(V_1 - V_2) \times c \times M$

$1000 \times m \times$

100% (A.2)

Where.

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

Volume of sodium hydroxide standard titration V_2 --- consumed blank test solution, in milliliters (mL);

c --- sodium hydroxide standard titration solution and the exact concentration, in units of moles per liter (mol/L);

Molar mass M --- alginic acid in grams per mole (g/mol) [$M(\text{C}_6\text{H}_8\text{O}_6) = 176.12$];

1000 --- conversion factor;

M --- the quality of the sample, in grams (g).

Take two parallel determination results of the arithmetic average of the measurement

results, the results of two parallel determination of the absolute difference is not more than 0.3%.

A.4.4 Determination of the content of sodium alginate A.4.4.1 Reagents and materials

A.4.4.1.1 Standard Solution. $c \text{ 12H}_2\text{SO}_4 \div = 0.05\text{mol/L}$.

A.4.4.1.2 sodium hydroxide standard titration solution. $c (\text{NaOH}) = 0.1\text{mol/L}$.

A.4.4.1.3 methyl red indicator solution. 1g/L ethanol solution.

A.4.4.2 analysis step Weigh about $1\text{g} \pm 2^\circ\text{C}$ drying 4h sample at 105°C , accurate to 0.2mg, placed in a porcelain crucible in an electric furnace to low temperature carbonization not After white smoke into the high-temperature furnace at $300^\circ\text{C} \sim 400^\circ\text{C}$ carbonized 2h. After cooling, the crucible together into a beaker, add 50mL water, plus 20mL sulfuric acid standard solution, cover the surface of the dish is heated in a water bath 1h. After cooling quantitative filter paper (filtrate color, should be re Weigh the sample, sufficient carbonization, repeating the same operation) to $60^\circ\text{C} \sim 70^\circ\text{C}$ water rinse beaker, crucible and the residue on the filter paper, Until the washing liquid does not make litmus paper red (with residue retention filter paper B, for the determination of ash insoluble). The combined washings and filtrate, Add 2 drops of methyl red indicator solution, titration with sodium hydroxide standard solution titration solution from red to yellow as the end point.

At the same time a blank test.

A.4.4.3 Calculation Results Alginate content mass fraction w_3 , according to equation (A.3) Calculated.

$$(V_0 - V_1) \times c \times M$$

$$1000 \times m \times$$

$$100\% \text{ (A.3)}$$

Where.

Volume V_0 --- sodium hydroxide standard titration blank test solution consumed in milliliters (mL);

Volume of sodium hydroxide standard titration V_1 --- filtrate and washings were consumed solution in milliliters (mL);

c --- sodium hydroxide standard titration solution and the exact concentration, in units of moles per liter (mol/L);

Molar mass M --- sodium alginate, in units of grams per mole (g/mol) [$M (\text{C}_6\text{H}_7\text{O}_6\text{Na}) = 198.11$];

1000 --- conversion factor;

M --- the quality of the sample, in grams (g).