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

GB 25551-2010

**National food safety standards of food additives sorbitan
monolaurate ester (Span 20)
(English Translation)**

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Table of Contents

Foreword

1 Scope

2 Normative reference documents

3 Technical requirements

Foreword

Appendix A of this standard is a normative appendix.

National standards for food safety Food additives Sorbitan monolaurate (pan 20)

1 Scope

This standard applies to lauric acid and sorbitan as raw materials, the esterification reaction of the food additive sorbitan monolaurate (Secretary 20).

2 Normative reference documents

The documents cited in this standard are indispensable for the application of this standard. Any reference to the date of the document, only the date of the edition this applies to this standard. For undated references, the latest edition (including all amendments) applies to this standard.

3 Technical requirements

3.1

sensory requirements. should be consistent with the provisions of Table 1.

Table 1 sensory requirements

The project requires a test method Color at room temperature for amber Tissue traits are viscous liquid at room temperature Take appropriate laboratory samples, placed in a clean, dry glass tube, in natural light Line, visual observation

3.2

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

Table 2 Physical and chemical indicators

Item Index Test Method Fatty acids, w /% 56 to 68 Appendix A, A.4 Polyols, w /% 36 ~ 49

Appendix A, A.5 Acid value (in KOH)/(mg/g) ≤ 7 Appendix A A.6 Saponification value (in KOH)/(mg/g) 155 ~ 170 Appendix A A.7 Hydroxyl value (in KOH)/(mg/g) 330 to 360 Appendix A A.8 Moisture, w /% ≤ 1.5 Appendix A, A.9 Burning residue, w /% ≤ 0.50 Appendix A. A.10 Arsenic (As)/(mg/kg) ≤ 3 Appendix A A.11 Lead (Pb)/(mg/kg) ≤ 2 Appendix A. A.12 Appendix A (Normative appendix) Testing method A.1 Warning Some of the test procedures specified in the test method may result in a hazardous situation. Operators should take appropriate safety and protective measures.

A.2 General provisions Unless otherwise stated, only the reagents identified as analytical reagents and the tertiary water specified in GB/T 6682-2008 are used in the analysis.

Standard titration solution used in the test method, standard solution for the determination of impurities, preparations and articles, in the absence of other requirements, GB/T 601, GB/T 602 and GB/T 603.

A.3 Identification test A.3.1 Determination of fatty acid value A.3.1.1 Reagents and materials A.3.1.1.1 anhydrous ethanol.

A.3.1.1.2 sodium hydroxide standard titration solution. $c(\text{NaOH}) = 0.5\text{mol/L}$.

A.3.1.1.3 phenolphthalein indicator solution. 10g/L .

A.3.1.2 Analysis steps Weigh about 3g A.4.3.2 in the coagulation D, accurate to 0.001g , placed in a conical flask, add 50mL of anhydrous ethanol dissolved, must to be heated. Add 5 drops of phenolphthalein indicator solution, titration with sodium hydroxide titration solution to the solution was pink, keep 30s does not fade for end.

A.3.1.3 Calculation of results the fatty acid value w_1 is expressed in milligrams per gram (mg/g) in terms of potassium hydroxide (KOH) and is calculated according to the formula (A.1) $w_1 = VcMm$ (A.1) where.

V - sodium hydroxide standard titration solution (A.3.1.1.2) in milliliters (mL);

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

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

M - the molar mass of potassium hydroxide in grams per mole (g/mol) [$M = 56.109$].

The arithmetic mean of the results of two parallel measurements is the result of the report. The absolute difference between the two parallel determinations is not more than 0.5 mg/g .

A.3.1.4 Judgment of results the recovered fatty acid value should be $270\text{mg/g} \sim 290\text{mg/g}$.

A.3.2 Polyol color test Take about 2g A.5.2 in the sticky material E, add 2mL catechol solution (100g/L) (now with the current), mix, plus 5mL sulfur Acid mixed, should be red or reddish brown.

A.4 Determination of Fatty Acids A.4.1 Methodological Summary the samples were hydrolyzed by saponification, and the fatty acids and polyols formed after acidification were separated by repeated extraction and concentrated to obtain a recovered fat the quality of the acid is calculated and the mass fraction of the fatty acids is calculated.

A.4.2 Reagents and materials A.4.2.1 Potassium hydroxide.

A.4.2.2 Ethanol (95%).

A.4.2.3 petroleum ether.

A.4.2.4 Sulfuric acid solution. 1 2.

A.4.3 Analysis steps A.4.3.1 Saponification. Weigh about 25g of laboratory samples, accurate to 0.01g. Placed in a 500 mL flask and 250 mL of ethanol was added (95%) and 7.5 g of potassium hydroxide. Connect the condenser and place it in a water bath for 2h. The saponification product was transferred to a 800 mL beaker the flask was washed with about 200 mL of water and transferred to the beaker. Place the beaker in a water bath and evaporate until the ethanol evaporates. Adjust with hot water the volume of the solution is about 250 mL, as solution A.

A.4.3.2 Acidification, Extraction Separation. Add sulfuric acid solution to Solution A with heating and stirring to precipitate the coagulum and add an excess of about 10% the sulfuric acid solution is cooled and layered. The supernatant was transferred to a 250 mL beaker which had a constant mass at 80 ° C and three times with 20 mL Hot water washing, cooling the lotion and the lower solution after the merger in a 500mL separatory funnel, 3 times with 100mL petroleum ether extraction, Floor. The lower layer B was transferred to a 800 mL beaker; the combined petroleum ether extract was added to a second 500 mL separatory funnel, 100 mL of water. The lower layer of water washing solution and solution B into solution C, retained for the determination of polyol content; transfer of the upper layer of petroleum ether extract in a beaker, placed in a water bath and concentrated in 100 mL, dried at 80 ° C until the mass was constant, and the recovered coagulum D was obtained as the quality of fatty acids. The coagulated substance D after weighing is used for the determination of the fatty acid value.

A.4.4 Calculation of results the mass fraction of fatty acids w_2 , expressed in%, is calculated according to equation (A.2).

$$w_2 = \frac{m_2 - m_1}{m} \times 100\%$$

Where.

m_1 --- 250mL beaker mass value in grams (g);

m_2 --- 250mL beaker plus solid D value of the value, in grams (g);

m - the mass of the sample, in grams (g).

The arithmetic mean of the results of two parallel measurements is the result of the report. The absolute difference between the two parallel determinations is not more than 1%.

A.5 Determination of polyol A.5.1 Reagents and materials A.5.1.1 anhydrous ethanol.

A.5.1.2 Potassium hydroxide solution. 100 g/L.

A.5.2 Analysis steps the solution C to pH 7 obtained in A.4.3.2 was neutralized with potassium hydroxide solution (tested with pH paper). Place the solution in a water bath Evaporated to white crystals. The polyol in the residue was then extracted twice with 150 mL of hot ethanol and the combined extracts were washed with G4 Glass funnel filter, anhydrous ethanol wash. The filtrate was transferred to another 800 mL beaker and concentrated in a water bath to about 100 mL. again Transferred to a 250 mL beaker in a constant mass at 80 ° C and continue to evaporate to a viscous shape. Dry at 80 ° C until the mass is constant and get sticky the quality of the complex E as the recovered polyol. After weighing the viscous material E for the polyol color test.

A.5.3 Calculation of results the polyol mass fraction, w_3 , is expressed in% and is calculated as in equation (A.3) $w_3 = \frac{m_2 - m_1}{m} \times 100\%$ (A.3) where.

m_1 --- 250mL beaker quality, in grams (g);

m_2 --- 250mL beaker plus viscous material quality, in grams (g);

m --- A.4.4 quality of the sample, in grams (g).

The arithmetic mean of the results of two parallel measurements is the result of the report. The absolute difference between the two parallel determinations is not more than 1%.

A.6 Determination of acid value A.6.1 Reagents and materials A.6.1.1 isopropanol.

A.6.1.2 Toluene.

A.6.1.3 sodium hydroxide standard titration solution. $c(\text{NaOH}) = 0.1\text{mol/L}$.

A.6.1.4 phenolphthalein indicator solution. 10g/L.

A.6.2 Analysis steps Weigh about 2.5g of laboratory samples, accurate to 0.0001g, placed in a conical flask, adding isopropyl alcohol and toluene 40mL, heated to make it Dissolve. Add 5 drops of phenolphthalein indicator solution, titration with sodium hydroxide titration solution to the solution was pink, keep 30s does not fade for the end.

A.6.3 Calculation of results the acid value w_4 , expressed as potassium hydroxide (KOH), is expressed in milligrams per gram (mg/g), calculated according to formula (A.4) $w_4 = \frac{V_1 c M m_1}{m}$ (A.4) where.

V_1 --- sodium hydroxide standard titration solution (A.6.1.3) volume of the value in milliliters (mL);

c - the exact value of sodium hydroxide standard titration solution concentration in moles