



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

GB 1886.57-2016

**National Food Safety Standard -- Food Additives -- Glycerol
Monocaprylate**

食品安全国家标准 食品添加剂 单辛酸甘油酯

(English Translation)

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1 Scope

This standard applies to octanoic acid, glycerol as raw material for esterification reaction after refining the food additive monicaprylate glycerol.

2.1 Molecular formula

C₁₁H₂₂O₄

2.2 Structural formula

H₂C O COC₇H₁₄

CH₂ OH

CH₂ OH

H₂C OH

CH₂ O COC₇H₁₄

CH₂ OH

2.3 Relative molecular mass

218.29 (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

The project requires a test method Colorless to pale yellow State at room temperature Take appropriate amount of sample, placed in a clean, dry glass tube, in the natural light, Observe its color and 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 Glyceryl monocaprylate content, w /% ≥ 80.0 Appendix A, A.2 Free glycerol, w /% ≤ 2.0 Appendix A A.3 Iodine value/(g/100g) ≤ 2.0 Appendix A A.4 Free acid (with bitterness), w /% ≤ 1.5 Appendix A A.5 Saponification value (in KOH)/(mg/g) 250 to 270 GB/T 13481-2011 Appendix A A.7a Total arsenic (in As)/(mg/kg) ≤ 3.0 GB 5009.11 Lead (Pb)/(mg/kg) ≤ 2.0 GB 5009.12 a sample size of 1.2g.

Appendix A

Testing method

A.1 General provisions Unless otherwise stated, only the reagents identified as analytical reagents and the tertiary water specified in GB/T 6682 were used in the analysis.

Standard titration solution, impurity standard solution, preparation and products used in the analysis, in the absence of other requirements, according to GB/T 601, GB/T 602 and GB/T 603. The solution used in the test refers to the aqueous solution when it is not specified in the formulation of the solvent.

A.2 Determination of glyceryl monocaprylate content A.2.1 Reagents and materials A.2.1.1 Glycerol.

A.2.1.2 Glacial acetic acid.

A.2.1.3 Mixed solution of periodate-acetic acid. 2.7 g/L. 2.7 g of periodic acid was dissolved in 50 mL of water and then 950 mL of glacial acetic acid was added the solution is protected from light.

At the same time should meet the following conditions. 0.5g ~ 0.6g glycerol dissolved in 50mL water, add 50mL periodate acid - acetic acid mixed solution, another Take 50mL of periodic acid-acetic acid mixed solution dissolved in 50mL water as a blank control. The prepared solution and the blank reagent were allowed to stand for 30 min, and then titration with sodium thiosulfate standard titration solution according to the procedure of A.2.2.2. After correction with blank titration, periodate - acetic acid the titration ratio of the mixed solution should be in the range of 0.75 to 0.76.

A.2.1.4 Acetic acid solution. 5%.

A.2.1.5 Trichloromethane. Take two 50 mL portions of periodic acid-acetic acid mixed

solution, add 50 mL of chloroform and 50 mL of water, respectively the titration solution was titrated with sodium thiosulfate standard titration according to the procedure of A.2.2.2. The difference between the two should not be higher than the value of 0.5mL.

A.2.1.6 Perchloric acid-acetic acid mixed solution. 10 4.4.10mL perchloric acid (commercially available, about 70%), add 4.4mL glacial acetic acid, shake Serve (ie with the use).

A.2.1.7 Potassium iodide solution. 150 g/L. 15g potassium iodide dissolved in water, water volume to 100mL, stored in a brown bottle.

A.2.1.8 sodium thiosulfate standard titration solution. $c(\text{Na}_2\text{S}_2\text{O}_3) = 0.1\text{mol/L}$.

A.2.1.9 Starch indicator. 10 g/L.

A.2.2 Analysis steps A.2.2.1 Sample preparation the sample must be homogeneous, if you need to melt, the melting temperature should not exceed its freezing point 10 °C, excessive heating will lead to a single sample the content of glyceryl caprylate is reduced. If the sample contains free glycerol, such samples should be completely mixed in the fierce mixing after uniform sampling and then weighing.

A.2.2.2 Determination Weigh about 0.15g ~ 0.17g sample, accurate to 0.001g, the sample dissolved in chloroform, all transferred to the 50mL volumetric flask Inside, with chloroform volume, shake well, and then all into the 250mL separatory funnel, and 50mL water four times rinse clean containers, Together into the separatory funnel, plug stopper, intense shaking the contents of 1min (middle inverted exhaust twice), and then set aside 1h ~ 3h to stratification, at this point the organic phase to be clear, or slightly cloudy (such as the formation of emulsion, can not be separated, available 50mL acetic acid solution instead of water redo). respectively the organic phase solution and aqueous solution were collected.

Take 25.00 mL of the organic phase solution in a 500 mL iodine flask, add 25.00 mL of a mixture of periodic acid-acetic acid, 0.04 mL Chloric acid-acetic acid mixed solution, shake the iodine bottle to make the mixture evenly, place the dark place for 30min, so that the full effect (Note. At this time the solution temperature should not exceed Over 20 °C, if the temperature is too high, available ice water compartment cooling). Add potassium iodide solution 10mL, shaking mixed, dark place 1min ~ 5min. Add 100mL of cold water, electromagnetic stirring mixed with sodium thiosulfate standard titration solution titrated to the water layer of iodine from brown to light yellow, Add starch to the liquid 2mL, continue to titrate until the blue completely disappeared (Note. should be vigorous stirring, so that the chloroform layer of iodine into the water layer) as a result, the volume of sodium thiosulfate standard solution was recorded. At the same time as a blank test.

The ratio of the volume of sodium thiosulfate standard solution consumed by the sample to the volume of sodium thiosulfate standard solution consumed by blank titration, the value should be 0.8 or slightly larger; otherwise, a smaller amount of the sample can be

re-measured. If the blank titration consumes the sodium thiosulfate standard solution when the volume of sodium thiosulfate standard solution consumed by the sample is less than 2 mL, the sample size is increased and the assay is repeated.

A.2.3 Calculation of results the mass fraction w_1 of the monoglyceride content is calculated according to formula (A.1) $w_1 = (V_0 - V_1) \times c \times M \times 1000 \times 100\%$ (A.1) where.

V_0 --- blank consumption of sodium thiosulfate standard titration solution volume, in milliliters (mL);

V_1 --- sample consumption of sodium thiosulfate standard titration solution volume, in milliliters (mL);

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

(M/mol), $[M(C_{11}H_{22}O_4) = 218.29]$; the molar mass of the mono- m --- the quality of the sample, in grams (g);

1000 --- volume conversion factor.

The test results are based on the arithmetic mean of the parallel measurement results (whichever is two decimal places). Two independent tests obtained under repetitive conditions the absolute difference between the results is not more than 1.0%.

A.3 Determination of free glycerol A.3.1 Reagents and materials A.3.1.1 Periodic acid-acetic acid mixed solution. same as A.2.1.3.

A.3.1.2 Potassium iodide solution. same as A.2.1.7.

A.3.1.3 sodium thiosulfate standard titration solution. $c(Na_2S_2O_3) = 0.1\text{mol/L}$.

A.3.1.4 Starch indicator. 10 g/L.

A.3.2 Analysis steps Take A.2.2.2 aqueous solution in 500mL iodine bottle, add 25.00mL periodate-acetic acid mixed solution for 30min ~ 90min, add 10.00mL potassium iodide solution, placed in the dark for 1min ~ 5min, add 100mL water, magnetic stirrer with stirring Sodium thiosulfate standard titration solution for titration, to the water layer of iodine from brown to light yellow, plus starch indicator solution 2mL, continue to titration to blue finished all disappeared, record the consumption of sodium thiosulfate standard titration solution volume. While 50 mL of water was used instead of the aqueous solution of A.2.2.2 Blank test.

A.3.3 Calculation of results the mass fraction of free glycerin w_2 is calculated according to formula (A.2) $w_2 = (V_0 - V_1) \times c \times M \times 4 \times 1000 \times 100\%$ (A.2) where.

V_0 --- blank consumption of sodium thiosulfate standard titration solution volume, in milliliters (mL);