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

GB 30605-2014

**National Food Safety Standard -- Food Additives -- Calcium
Glycinate**

食品添加剂 甘氨酸钙

(English Translation)

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Table of Contents

- 1 Scope
- 2 Molecular formula, structural formula and relative molecular mass
 - 2.1 Molecular formula
 - 2.2 Structural formula
 - 2.3 Relative molecular mass
- 3 Technical requirements
 - 3.1 Sensory requirements
 - 3.2 Physical and chemical indicators
- 98.0 Appendix A, A.3

1 Scope

This standard applies to glycine and calcium hydroxide reaction, by cooling crystallization of the food additive glycine calcium.

2.1 Molecular formula

Ca (OOCCH₂NH₂)₂ · H₂O.

2.3 Relative molecular mass

206.21 (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

The project requires a test method Color white State crystalline powder Take the appropriate amount of sample in a clean, dry white porcelain dish, under 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 Calcium content of glycine [calculated as Ca (OOCCH₂NH₂)₂ ·

H₂O] (Mass fraction) /% >=

98.0 Appendix A, A.3

Nitrogen (mass fraction) /% 13.0 ~ 14.5 A.4 pH (10 g/L aqueous solution) 10.0 to 12.0 GB/T 9724 Dry reduction (mass fraction) /% <= 9.0 GB 5009.3 direct drying method a Lead (Pb)/(mg/kg) <= 2 GB 5009.12 a105 °C, 3h.

Appendix A

Testing method

A.1 General provisions the reagents and water used in this standard refer to the pure reagent and the tertiary water specified in GB/T 6682 when no other requirements are specified.

Standard solution used in the test, the standard solution of impurities, preparations and products, in the absence of other requirements, according to GB/T 601, GB/T 602, 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 Identification test A.2.1 Reagents and materials A.2.1.1 Acetic acid.

A.2.1.2 Hydrochloric acid.

A.2.1.3 Ammonium oxalate solution. 35 g/L.

A.2.1.4 Sodium nitrite solution. 100 g/L.

A.2.1.5 Hydrochloric acid solution. 1 3.

A.2.1.6 methyl red indicator solution. 1g/L.

A.2.2 Identification method A.2.2.1 Identification of calcium Weigh about 0.5g sample, accurate to 0.01g, dissolved in 10mL water, add 2 drops of methyl red indicator solution, with hydrochloric acid solution and drop Add to the solution was acidic, drop ammonium oxalate solution that white precipitate. The precipitate is insoluble in acetic acid but is soluble in hydrochloric acid.

A.2.2.2 Identification of amino groups Weigh about 0.1g sample, accurate to 0.01g, dissolved in 10mL water, add hydrochloric acid solution 1mL and the newly prepared sodium nitrite solution 1 mL produces a colorless gas.

A.2.2.3 Identification of infrared spectroscopy the samples were prepared by infrared absorption spectrophotometry and potassium bromide tableting. The samples were compared with the control spectra (see Appendix B).

Should be basically the same.

A.3 Determination of calcium content in glycine A.3.1 Methodological Summary Specimen

with calcium carboxylate as an indicator, with ethylenediamine tetraacetic acid disodium standard titration solution titration, calculate the sample of calcium glycine content.

A.3.2 Reagents and materials A.3.2.1 Sodium hydroxide solution. 1 mol/L.

A.3.2.2 Disodium EDTA (EDTA) Standard titration solution. $c(\text{EDTA}) = 0.1 \text{ mol/L}$.

A.3.2.3 Calcium Carboxylic Acid Indicator. Weigh 1g calcium carboxylic acid indicator and 100g sodium chloride.

A.3.3 Analysis steps Weigh about 0.5g sample, accurate to 0.0001g, placed in 250mL Erlenmeyer flask, add 100mL of water, dissolved, add 15mL hydrogen Sodium oxide solution, add 0.1g calcium carboxylic acid indicator, with ethylenediamine tetraacetic acid disodium standard titration solution titrated to blue as the end.

At the same time as the measurement, the same amount of reagent solution was used as a blank test in the same procedure as in the measurement.

A.3.4 Calculation of results Glycine calcium content of the mass fraction w_1 according to formula (A.1) calculation.

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

$m \times 1000 \times$

100% (A.1)

Where.

V_1 --- sample consumption EDTA standard titration solution volume value in milliliters (mL);

V_0 --- blank test consumption EDTA standard titration solution volume value in milliliters (mL);

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

M g-glycine calcium molar mass in grams per mole (g/mol) $\{M [\text{Ca} (\text{OOCCH}_2\text{NH}_2)_2 \cdot \text{H}_2\text{O}] = 206.21\}$;

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

1000 --- conversion factor.

The results of the test are based on the arithmetic mean of the parallel measurement results. The absolute difference between the two independent determinations obtained under repeatability conditions the value is not greater than 0.3%.

A.4 Determination of nitrogen A.4.1 Methodological Summary Determination of nitrogen content in samples by Kjeldahl method.

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

A.4.2.2 copper sulfate pentahydrate.

A.4.2.3 Sulfuric acid.

A.4.2.4 Sodium hydroxide solution. 300 g/L.

A.4.2.5 Boric acid solution. 20 g/L.

A.4.2.6 Standard titration solution for hydrochloric acid. $c(\text{HCl}) = 0.1 \text{ mol/L}$.

A.4.2.7 Methyl red-methine blue mixed indicator solution.

A.4.3 Analysis steps A.4.3.1 Automatic nitrogen fixation method (Arbitration method) Weigh about 0.25g sample, accurate to 0.0001g, placed in automatic nitrogen digestion tube, add 3.0g potassium sulfate, 0.15g pentahydrate Acid copper, along the bottle wall slowly add 10mL sulfuric acid. Placed on the digestion device, digested at 400 °C for 40min, cooling. Placed in the automatic nitrogen device Set, digestion tube by adding 60mL sodium hydroxide solution, the absorption bottle by adding 50mL boric acid solution and 8 drops of methyl red - methine blue mixed Indicator solution, distilled to the distillate neutral. Titration with hydrochloric acid titration solution to the end of gray purple.

At the same time as the measurement, the same amount of reagent solution was used as a blank test in the same procedure as in the measurement.

A.4.3.2 Direct distillation method the measurement was carried out by direct distillation in HG/T 4103. 0.3 g of the sample was weighed.

A.4.4 Calculation of results the mass fraction w_2 of the nitrogen content (on a dry basis) is calculated according to formula (A.2) $w_2 = (V_1 - V_0) \times c \times M \times 1000 \times 100\%$ (A.2) where.

V_1 --- sample consumption of hydrochloric acid standard titration solution volume of the value in milliliters (mL);

V_0 --- blank test consumption of hydrochloric acid standard titration solution volume value in milliliters (mL);

c - the exact value of the standard titration solution for hydrochloric acid, in moles per liter (mol/L);

M - the molar mass of the nitrogen in grams per mole (g/mol) [$M(\text{N}) = 14.01$];

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

1000 --- conversion factor.

The results of the test are based on the arithmetic mean of the parallel measurement results. The absolute difference between the two independent determinations obtained under repeatability conditions Value is not greater than 0.2%.