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

GB 1903.2-2015

**National Food Safety Standard -- Food Nutrition Enhancer --
Zinc glycinate**

食品安全国家标准 食品营养强化剂 甘氨酸锌

(English Translation)

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1 Scope

This standard applies to the reaction of glycine and zinc oxide, obtained by cooling crystallization food fortifier glycine zinc.

2 Molecular formula, relative molecular mass and structural formula

Formula 2.1

$\text{Zn}(\text{OOCCH}_2\text{NH}_2)_2$

2.3 Relative molecular mass

213.51 (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 Color White Status crystalline powder Take the right amount of sample is placed in a clean, dry white porcelain dish, in natural light Under observe its color and 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 Glycine zinc content (dry basis), w /% ≥ 98.0 Appendix A A.3
Nitrogen (dry basis), w /% 12.5 ~ 13.5 Appendix A A.4 pH (10g/L aqueous solution) 7.0 ~

9.0 GB/T 9724 Loss on drying, w /% $\leq$ 0.5 GB 5009.3 a direct drying Lead (Pb)/(mg/kg) $\leq$ 4.0 GB 5009.12 Cadmium (Cd)/(mg/kg) $\leq$ 5.0 GB 5009.15 a drying temperature of 105 °C, drying time is 3h.

Appendix A

Testing method

A.1 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.

Standard solutions used in the tests, impurity standard solution, preparations and products, did not indicate when the other requirements, according to GB/T 601, GB/T 602 and GB/T 603 provisions prepared. Solution was used in the tests did not indicate what is formulated with solvent, it refers to an aqueous solution.

A.2 Identification Test A.2.1 Reagents and materials A.2.1.1 hydrochloric acid solution. 13.

A.2.1.2 potassium ferrocyanide solution. 100g/L. Now with this solution when required.

A.2.1.3 sodium sulfide solution. 100g/L. Now with this solution when required.

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

A.2.2 Identification method A.2.2.1 Identification of zinc Take A, B two 25mL colorimetric tube, were weighed approximately 0.2g sample accurate to 0.01g, was dissolved in 20mL of water to dissolve armor tube Solution, a solution of potassium ferrocyanide solution, namely a white precipitate which is insoluble in hydrochloric acid solution. Ask acetate tube was added a solution of sodium sulfide solution I.e. liquid A white precipitate which is dissolved in hydrochloric acid solution.

A.2.2.2 Identification of amino Weigh about 0.1g sample accurate to 0.01g, hydrochloric acid solution is added 1mL and sodium nitrite solution freshly prepared 1mL colorless gas.

A.2.2.3 Identification of Infrared Spectra by infrared absorption spectrophotometry, IR spectrum of the sample is done with the control spectrum by KBr tablet method (see Appendix B) Comparison of the two should be Basically the same.

A.3 Determination of glycine zinc content (dry basis) of A.3.1 Method summary Samples with chrome black T as indicator, with disodium edetate standard titration solution titration, the sample is calculated glycine zinc content.

A.3.2 Reagents and materials A.3.2.1 ammonia - ammonium chloride buffer solution (pH~10). Weigh 54g of ammonium chloride, dissolved in water, add 350mL ammonia, dilute to 1000mL.

A.3.2.2 disodium edetate (EDTA) standard titration solution. c (EDTA) = 0.1mol/L.

A.3.2.3 chrome black T indicator solution. 5g/L.

A.3.3 Analysis step

Weigh about 0.5g dried sample was measured under the conditions of the reduction after drying, accurate to 0.0001g, placed in 250mL conical flask, 100mL of water, was added 5mL ammonia - ammonium chloride buffer solution, dissolved by adding 5 drops of Eriochrome Black T indicator solution with disodium edetate dropwise standard Scheduled for the end solution was titrated to blue.

Measured at the same time, but without the sample using the same amount of reagent blank test solution.

A.3.4 Calculation Results Glycine zinc content (dry basis) of the mass fraction w_1 , according to equation (A.1) Calculated.

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

$$m \times 1000 \times$$

$$100\% \text{ (A.1)}$$

Where.

Volume V_1 --- sample consumed EDTA standard titration solution, in milliliters (mL);

V_0 --- blank test consumed volume of EDTA standard titration solution, in milliliters (mL);

Concentration c --- EDTA standard titration solution, expressed in moles per liter (mol/L);

--- The M glycine molar mass of zinc in grams per mole (g/mol), $\{M [\text{Zn} (\text{OOCCH}_2\text{NH}_2)_2] = 213.51\}$;

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

1000 --- conversion factor.

The results parallel arithmetic mean of the measurement results shall prevail. Twice under the same condition of independent determination results obtained absolute difference not more than 0.3%.

A.4 nitrogen (dry basis) of the Determination A.4.1 Method summary Determination of the nitrogen content in the sample 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. 300g/L.

A.4.2.5 boric acid. 20g/L.

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

A.4.2.7 methyl red - methylene blue mixed indicator solution.

A.4.3 Analysis step

A.4.3.1 Automatic Instrument of Nitrogen Nitrogen Analysis (Arbitration Act) Weigh about 0.25g in dry weight loss after the sample was measured under dry conditions, accurate to 0.0001g, placed by automatic nitrogen tester digestive tract, Potassium sulfate was added 3.0g, 0.15g five water copper sulfate, sulfuric acid 10mL was added slowly along the sides of the bottle. Placed on the digestive system, digestion at 400 °C 40min, cooled. On the N-Gage device, placed in the digestive tract was added sodium hydroxide solution automatically set 60mL, 50mL boric acid absorption flask Solution and 8 drops of methyl red - methylene blue mixed indicator solution, distilled to a distillate neutral. Titration with hydrochloric acid standard solution titration to purple to gray end.

Measured at the same time, but without the sample using the same amount of reagent blank test solution.

A.4.3.2 direct distillation method Press HG/T 4103 in direct distillation method was measured. Take 0.3g in weight loss was measured after drying under drying conditions measured says Sample.

A.4.4 Calculation Results Nitrogen (dry basis) of the mass fraction w_2 , according to equation (A.2) Calculated.

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

$$m \times 1000 \times$$

$$100\% \text{ (A.2)}$$

Where.

Volume V_1 --- sample consumption hydrochloric acid standard titration solution, in milliliters (mL);

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

c --- hydrochloric acid standard titration solution concentration, in units of moles per liter (mol/L);

--- The M molar mass of nitrogen in grams per mole (g/mol), [$M(N) = 14.01$];

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

1000 --- conversion factor.

The results parallel arithmetic mean of the measurement results shall prevail. Twice under the same condition of independent determination results obtained absolute difference not more than 0.2%.