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

GB 30606-2014

**National Food Safety Standard -- Food Additives -- Ferrous
Bisglycinate**

食品添加剂 甘氨酸亚铁

(English Translation)

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1 Scope

This standard applies to glycine and reduced iron powder reaction, the spray drying of the food additive glycine ferrous.

2.1 Molecular formula

Fe (OOCCH₂NH₂)₂ · 2H₂O.

2.3 Relative molecular mass

239.99 (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 dark brown or gray green State powder Take the appropriate amount of sample in a clean, dry white porcelain dish in the natural light, observe the 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 (Fe²⁺) content (in dry basis), w /% 20.0 to 23.7 Appendix A, A.3
Nitrogen (based on dry basis), w /% 10.0 ~ 12.0 A.4 Ferric (Fe³⁺) (dry basis), w /% ≤ 2.0

A.5 Dry reduction, w /% ≤ 7.0 GB 5009.3 direct drying method a Total iron (on a dry basis), w /% 19.0 ~ 24.0 A.6 Lead (Pb)/(mg/kg) ≤ 1 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 hydrochloric acid solution. 1 3.

A.2.1.2 potassium ferricyanide solution. 100g/L, prepared before use.

A.2.1.3 Sodium hydroxide solution. 43 g/L.

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

A.2.2 Identification method A.2.2.1 Identification of bivalent iron Weigh about 0.1g sample, accurate to 0.01g, dissolved in 10mL water, to this solution by adding potassium cyanide solution, that is, dark blue of the precipitation. The precipitate was insoluble in hydrochloric acid solution but was dissolved in sodium hydroxide solution. Also called about 0.1g sample, accurate to 0.01g, soluble 20mL water, dropping sodium hydroxide solution that produces green and white precipitation, after moving the color becomes green, and then become tan.

A.2.2.2 Identification of amino groups Weigh about 0.1g sample, accurate to 0.01g, dissolved in 10mL water, add 5 drops of hydrochloric acid solution 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 ferrous content A.3.1 Methodological Summary in the acidic medium, the sample was titrated with 1,10-phenanthroline-ferrous as standard and titrated with standard titration with cerium sulfate standard.

Iron content.

A.3.2 Reagents and materials A.3.2.1 Sulfuric acid.

A.3.2.2 standard titration solution of cerium sulfate. $c [\text{Ce} (\text{SO}_4)_2] = 0.1 \text{ mol/L}$.

A.3.2.3 1,10-phenanthroline-ferrous indicator liquid.

A.3.3 Analysis steps Approximately 1 g of the dried sample under dry reduction conditions was weighed to 0.0001 g, placed in a solution of 150 mL of water and 10 mL of sulfuric acid in a 300 mL Erlenmeyer flask. Add 1 drop of 1,10-phenanthroline-ferrous indicator solution, immediately with cerium sulfate standard titration solution Liquid titration to light yellow for 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 the mass fraction w_1 (%) of the divalent iron content (on a dry basis) is calculated according to formula (A.1) $w_1 = (V_1 - V_0) \times c \times M \times 1000 \times 100\%$ (A.1) where.

V_1 --- sample consumption of cerium sulfate standard titration solution volume value in milliliters (mL);

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

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

M - the molar mass of iron in grams per mole (g/mol) [$M (\text{Fe}) = 55.85$];

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%.

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 0.3g in the dry reduction under the conditions of dry test samples, accurate to 0.0001g, placed in the automatic nitrogen digestion tube, Add 3.0g potassium sulfate, 0.15g copper sulfate pentahydrate, along the bottle wall slowly add 10mL sulfuric acid. Placed on the digestion device, at 400 °C digestion 40 min, cooling. Placed in the automatic nitrogen device, the digestion tube by adding 60mL sodium hydroxide solution, the absorption bottle by adding 50mL boron Acid solution and 8 drops of methyl red - methine blue mixed indicator solution, distilled to the distillate was neutral. Titration with hydrochloric acid standard titration to gray purple for 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.4.3.2 Direct distillation method the measurement was carried out by direct distillation in HG/T 4103. 0.4 g was weighed after drying under dry reduction measurement Sample.

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) [$M(N) = 14.01$];

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 (leave a decimal). Two independent tests obtained under repetitive conditions the absolute difference between the results is not more than 0.2%.

A.5 Determination of ferric iron A.5.1 Methodological Summary in the acidic medium, the sample was titrated with starch as the indicator and titrated with sodium thiosulfate standard to calculate the trivalent iron content in the sample.

A.5.2 Reagents and materials A.5.2.1 Hydrochloric acid.

A.5.2.2 Potassium iodide.