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

GB 25542-2010

**The national food safety standards of food additives glycine
(amino acid)
(English Translation)**

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1 Scope

This standard is applicable to the process of recrystallization of industrial aminoacetic acid obtained by the monochloroacetic acid amination process by dissolving purified water and decolorizing activated carbon the resulting food additive is glycine (aminoacetic acid).

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.

3.1 Molecular formula

C₂H₅NO₂

3.2 Structural formula

CH₂NH₂

C OH

3.3 Relative molecular mass

75.07 (according to 2007 International Relative Atomic Quality)

4 Technical requirements

4.1

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

Table 1 sensory requirements

The project requires a test method Color white Organizational state Crystalline granules or crystalline powders Take appropriate laboratory samples, placed in a clean, dry white porcelain dish, in natural light Under the visual observation

4.2

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

Table 2 Physical and chemical indicators

Item Index Test Method Aminoacetic acid (on a dry basis), w /% 98.5 to 101.5 Appendix A, A.4 Chloride (in Cl), w /% ≤ 0.010 Appendix A A.5 Arsenic (As)/(mg/kg) ≤ 1 Appendix A A.6 Heavy metals (Pb)/(mg/kg) ≤ 10 Appendix A A.7 Dry reduction, w /% ≤ 0.20 Appendix A, A.8 Residue on ignition, w /% ≤ 0.10 Appendix A, A.9 the clarity test was carried out in Test Appendix A. A.10 pH (50 g/L aqueous solution) 5.5 to 7.0 Appendix A A.11 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 Reagents and materials A.3.1.1 Indanetone solution. 1 g/L.

A.3.1.2 Hydrochloric acid solution. 1 3.

A.3.1.3 Sodium nitrite solution. 100 g/L.

A.3.1.4 Chromic acid solution. Weigh 0.5g of chromic acid, add 50mL sulfuric acid solution (2 1) shake, centrifugal separation, the use of supernatant.

The solution should be prepared before use.

A.3.2 Analysis steps A.3.2.1 Indanone test Weigh about 0.1g of laboratory samples, accurate to 0.01g, dissolved in 100mL water, take this solution 5mL, add 1mL indan three ketone dissolved Liquid, heated to boiling about 3min after the purple.

A.3.2.2 Nitroso test Weigh about 1g of laboratory samples, accurate to 0.01g, dissolved in 10mL water, take this solution 5mL, add 5 drops of hydrochloric acid solution and 1mL the newly prepared sodium nitrite solution produces a colorless gas. The solution 5 drops into

the test tube, boiled in the water bath on the steam, cooling, to the residue Add 5 drops to 6 drops of chromic acid solution, in the water bath for 10min ~ 30min after the deep purple.

A.4 Determination of aminoacetic acid A.4.1 Methodological Summary Samples to formic acid as a co-solvent, glacial acetic acid as a solvent to crystal violet as an indicator, titration with perchloric acid standard titration, according to high consumption Determination of the content of aminoacetic acid by the volume of the standard titration solution of chloric acid.

A.4.2 Reagents and materials A.4.2.1 Glacial acetic acid.

A.4.2.2 anhydrous formic acid.

A.4.2.3 Perchloric acid standard titration solution. $c(\text{HClO}_4) = 0.1 \text{ mol/L}$.

A.4.2.4 Crystal violet indicator solution. 2 g/L .

A.4.3 Analysis steps A.4.3.1 Weigh dry matter A in about 0.15 g A.8.1, accurate to 0.0001 g , placed in 250 mL dry conical flask, add about 1 mL anhydrous formic acid dissolved, add 30 mL glacial acetic acid, add 2 drops of crystal violet indicator solution, titration with perchloric acid standard titration solution to the solution by the purple Color turns to bright blue and green for the end.

A.4.3.2 At the same time as the determination, the same amount of reagent solution was used as a blank test in the same procedure as for the measurement.

A.4.4 Calculation of results the mass fraction w_1 of the aminoacetic acid (on a dry basis) is expressed in% and is calculated according to the formula (A.1) $w_1 = (V_1 - V_2) \times c \times M \times 1000 \times 100\%$ (A.1) where.

V_1 --- sample consumption perchloric acid standard titration solution (A.4.2.3) volume in milliliters (mL);

V_2 --- blank consumption Perchloric acid standard titration solution volume value in milliliters (mL);

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

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

M - The molar mass of aminoacetic acid in grams per mole (g/mol) ($M = 75.07$).

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 0.3%.

A.5 Determination of chloride A.5.1 Reagents and materials A.5.1.1 Nitric acid solution. 1 g .

A.5.1.2 Silver nitrate solution. 17 g/L .

A.5.1.3 Chloride (Cl) Standard solution. 0.1 mg/mL .

A.5.2 Analysis steps Weigh about 1.0g of laboratory samples, accurate to 0.01g, placed in 50mL colorimetric tube, add 30mL of water dissolved, add 6mL nitric acid dissolved Liquid, add water to 50mL for the sample solution. Take another color tube, add 1mL $\pm$ 0.02mL chloride (Cl) standard solution, add 30mL Water, add 6mL nitric acid solution, add water to 50mL as the standard turbid liquid. Add 1 mL of silver nitrate to the sample solution and standard than the turbid solution Solution, fully mixed, to avoid direct sunlight, placed 5min, in the black background side or axial observation, the sample solution of turbidity Greater than the turbidity of the standard turbid liquid.

A.6 Determination of arsenic According to GB/T 5009.76 arsenic spot method. Measure about 1.0g of laboratory samples, accurate to 0.01g. Limited standard solution Preparation. Remove 1mL $\pm$ 0.02mL arsenic standard solution (containing arsenic containing 1.0 μ g) with pipettes and treat the same sample at the same time as the sample.

A.7 Determination of heavy metals A.7.1 Reagents and materials A.7.1.1 Sodium hydroxide solution. 43 g/L.

A.7.1.2 Sodium sulfide solution. 100g/L, the solution should be prepared before use.

A.7.1.3 Lead (Pb) standard solution. 0.01 mg/mL.

A.7.2 Analysis steps Weigh about 1.0g of laboratory samples, accurate to 0.01g, placed in 25mL colorimetric tube, add 5mL sodium hydroxide solution, add water and diluted to 25mL, add 5 drops of sodium sulfide solution, shake, place 2min, the color should not be deeper than the standard. The standard is to absorb 1mL $\pm$ 0.02 mL lead (Pb) limited standard solution (lead 0.01mg), the same treatment with the sample at the same time.

A.8 Determination of dry reduction A.8.1 Analysis steps Weigh about 1.0g of laboratory samples, accurate to 0.0001g, placed in the pre-105 °C $\pm$ 2 °C dry to the constant quality of the weighing bottle , And a layer of 5 mm or less is laid. In 105 °C $\pm$ 2 °C constant temperature drying oven for 3h, placed in a dryer for 30min cooling.

A portion of the dried product (this is dry matter A) is used for the determination of the aminoacetic acid content.

A.8.2 Calculation of results the mass fraction w2 of the drying reduction, the value in%, calculated according to the formula (A.2).

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

Where.

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

m1 --- the mass of the sample after drying, 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 0.05%.