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

GB 25543-2010

**National food safety standards of food additives L-alanine
(English Translation)**

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Foreword

Appendix A of this standard is a normative appendix.

National standards for food safety Food Additives L-Alanine

1 Scope

This standard applies to L-aspartic acid as raw material, the enzymatic production of food additives L-alanine.

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

C₃H₇NO₂

3.3 Relative molecular mass

89.09 (according to the 2007 international relative atomic mass)

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 Crystallization or crystalline powder Take appropriate laboratory samples, placed in a clean, dry white porcelain dish, in the natural light, visual Observe, smell the smell

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 L-alanine (on a dry basis), w /% 98.5 to 101.5 Appendix A, A.4 Dry reduction, w /% $\leq$ 0.20 Appendix A, A.5 pH (50g/L aqueous solution) 5.7 to 6.7 Appendix A, A.6 Arsenic (As)/(mg/kg) $\leq$ 1 A.7 in Appendix A.

Heavy metals (Pb)/(mg/kg) $\leq$ 10 Appendix A A.8 Residue on ignition, w /% $\leq$ 0.20 Appendix A, A.9 Specific rotation α_D^{20} [(°) · dm² · kg⁻¹] 13.5 to 15.5 Appendix A A.10 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 Potassium permanganate.

A.3.1.2 Indanetone solution. 20 g/L. Weigh 20.0 g of indanetone, dissolved in water and diluted to 1000 mL.

A.3.1.3 Sulfuric acid solution. 1 30.

A.3.2 Analysis steps A.3.2.1 Indanone test Weigh about 1g of laboratory samples, accurate to 0.1g, dissolved in 1000mL water, take this solution 5mL, add 1mL indan three ketone dissolved Liquid, heated to boiling, about 3min after the purple.

A.3.2.2 Oxidation test Weigh about 0.2g of laboratory samples, dissolved in 10mL sulfuric acid solution, add 0.1g potassium permanganate, boil, have a strong stimulating odor B Aldehyde production.

A.4 Determination of L-alanine content 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 the volume of L-alanine was calculated 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. 2g/L.

A.4.3 Analysis steps A.4.3.1 Weigh dry matter A in about 0.2gA.5, accurate to 0.0001g, placed in 250mL dry Erlenmeyer flask, add 3mL Anhydrous formic acid dissolved, add 50mL glacial acetic acid, add 2 drops of crystal violet indicator solution, titration with perchloric acid titration solution to the solution from blue to 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 L-alanine ($\text{C}_3\text{H}_7\text{NO}_2$) mass fraction w_1 , the value in%, calculated according to formula (A.1).

$$(V_1 - V_2) \times c \times M$$

$$m \times 1000 \times 100\%$$

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 (A.4.2.3) volume 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 - L-alanine in grams per mole (g/mol) ($M = 89.09$).

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 dry reduction According to GB/T 6284. Determination, weighed 1g ~ 2g laboratory samples, accurate to 0.0001g. Take two parallel measurements the arithmetic mean is the result of the measurement, and the absolute difference between the two parallel determinations is not more than 0.03%. Keep some dry matter (this is dry A) was used for the determination of L-alanine content.

A.6 Determination of pH According to GB/T 9724. At the time of measurement,

approximately 5 g of laboratory samples were weighed, accurate to 0.01 g, plus about 20 mL of water without carbon dioxide Dissolved and diluted to 100mL after the determination.

A.7 Determination of arsenic According to GB/T 5009.76 arsenic spot method. Measure about 1g of laboratory samples, accurate to 0.01g. Limited amount of standard solution System. with a pipette to remove 1.00mL arsenic limited standard solution (containing arsenic 0.001mg), the same sample with the same treatment.

A.8 Determination of heavy metals A.8.1 Reagents and materials A.8.1.1 thioacetamide solution. Weigh thioacetamide about 4g, accurate to 0.1g, dissolved in 100mL water, placed in the refrigerator.

Before the application, 1.0 mL of the solution was added to a mixture of 15 mL of sodium hydroxide solution (40 g/L), 50 mL of water and 20 mL of glycerin 5mL, placed in a water bath for 20s, cooling immediately use.

A.8.1.2 No carbon dioxide water.

A.8.1.3 Ammonium acetate buffer solution, pH = 3.5. Weigh 25.0 g of ammonium acetate, dissolved in 25 mL of water, plus 45 mL of 6 mol/L salt Acid, adjusted to pH = 3.5 with dilute hydrochloric acid or dilute aqueous ammonia, and diluted with water to 100 mL.

A.8.1.4 Lead (Pb) standard solution. 1 µg/mL. This solution was prepared before use.

A.8.2 Analysis steps Weigh about 10g of laboratory samples, accurate to 0.01g, with about 60mL without carbon dioxide water dissolved and diluted to 100mL, as the sample Solution. Absorb the sample solution 12mL, placed in 25mL with a colorimetric tube, that is, A tube. Draw 10 mL of lead standard solution and 2 mL the sample solution was placed in a 25 mL stoppered colorimetric tube and shaken well as a B tube (standard). Take 10 mL of carbon dioxide-free water and 2 mL of sample Solution set 25mL with a colorimetric tube, shake, that is C tube (blank). In the A, B, C tube, each add 2mL ammonium acetate buffer solution, Shake, respectively, add 1.2mL thioacetamide solution, stir and mix quickly.

Relative to the C tube, B tube showed a light brown. 2min, A tube color should not be deeper than the B tube.

A.9 Determination of burning residue A.9.1 Reagents and materials A.9.1.1 Sulfuric acid.

A.9.1.2 Sulfuric acid solution. 1 8.

A.9.2 Analysis steps Weigh about 2g ~ 3g of laboratory samples, accurate to 0.0001g, placed at 800 °C ± 25 °C burning to the quality of the porcelain crucible , Add the appropriate amount of sulfuric acid solution to completely wet the sample. Heat with a warm fire to the sample completely carbonized and cooled. Add about 0.5mL sulfuric acid dip Wet residue, heated to sulfuric acid vapor by the above method. In the 800 °C ± 25 °C burning 45min. Into the dryer to cool to room temperature, Weighing.

A.9.3 Calculation of results the mass fraction w₂ of the ignition residue, expressed in%, is