

ICS 67.220.20
CCS C 54;X40



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

GB 28306-2012

National food safety standards -- Food additives -- L-arginine

食品添加剂 L-精氨酸

(English Translation)

Issued on: April 25, 2012

Implemented on: June 25, 2012

Issued by: Ministry of Health of the People's Republic of China

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1 Scope

This standard applies to starch raw materials by fermentation, extraction of food additives L-arginine.

2.1 Molecular formula

C₆H₁₄N₄O₂

2.3 Relative molecular mass

174.20 (according to the 2007 International Relative Atomic Quality)

3 Technical requirements

3.1

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

Table 1 sensory requirements

The project requires a test method Color white Odor has a characteristic odor State crystalline or crystalline powder Take appropriate sample in a clean, dry white porcelain dish Under natural light, observe its color and tissue state, and sniff its taste

3.2

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

Table 2 Physical and chemical indicators

Item Index Test Method L-arginine content (on a dry basis), w /% 98.5 to 101.5 Appendix A, A.3 Specific rotation α_D^{20} [(°) · dm² · kg⁻¹] 26.0 ~ 27.9 Appendix A A.4 Clarity and color clarity, colorless Appendix A A.5 pH 10.0 to 12.0 Appendix A, A.6 Chloride (in Cl-terms), w /% ≤ 0.1 Appendix A A.7 Total arsenic (in As)/(mg/kg) ≤ 2 Appendix A A.8

Dry reduction, $w / \% \leq 1.0$ Appendix A A.9 Burning residue, $w / \% \leq 0.2$ Appendix A. A.10 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 682-2008 when no other requirements are specified.

Standard titration solution used in the test, the standard solution for the determination 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 Weigh the sample about 1mg, add about 120mg potassium bromide, grinding evenly, tablet. Record the infrared spectrum of the sample.

The infrared spectrum of the sample should be consistent with the standard infrared spectrum.

A.3 Determination of L-arginine content A.3.1 Reagents and materials A.3.1.1 anhydrous formic acid.

A.3.1.2 Glacial acetic acid.

A.3.1.3 crystal violet indicator solution. Weigh crystal violet 0.5g, add glacial acetic acid dissolved 100mL.

A.3.1.4 Standard titration solution of perchloric acid. $c(\text{HClO}_4) = 0.1 \text{ mol/L}$.

A.3.2 Analysis steps Weigh the sample about 0.2g, accurate to 0.0001g, add anhydrous formic acid 3mL and glacial acetic acid 50mL to dissolve, add crystal violet instructions Liquid 2 drops, with perchloric acid titration solution (0.1mol/L) titration to the solution from blue to green, with the law to do blank test.

A.3.3 Calculation of results the content of L-arginine is expressed in terms of mass fraction w_1 of L-arginine ($\text{C}_6\text{H}_{14}\text{N}_4\text{O}_2$), expressed in terms of formula (A.1) $w_1 = (V - V_0) \times c \times 87.10 \text{ m} \times (1 - w) \times 100\%$ (A.1) where.

V - Specimen titration consumption Perchloric acid titration solution (0.1mol/L) volume in milliliters (mL);

V_0 --- blank titration consumption perchloric acid titration solution (0.1mol/L) volume in milliliters (mL);

c - Perchloric acid titrant concentration in moles per liter (mol/L);

m --- the quality of the sample in milligrams (mg);

w - dry weight reduction of sample,%;

87.10 --- L-arginine 12 equivalent to 1mL perchloric acid titrant (1mol/L) ($\text{C}_6\text{H}_{14}\text{N}_4\text{O}_2$) the amount of units in milligrams (mg).

The experimental results are based on the arithmetic mean of the parallel measurement results. The absolute difference between the two independent determinations obtained under repeatability conditions the ratio of the value to the arithmetic mean is not more than 0.5%.

A.4 Determination of specific rotation A.4.1 Reagents and materials Hydrochloric acid solution. 6mol/L.

A.4.2 Analysis steps Weigh 8g of dried sample in Chapter 9, accurate to 0.0001g, add 6mol/L hydrochloric acid solution to dissolve and dilute the volume to 100mL, shake, put it aside for 10min. Adjust the solution temperature to $20\text{ }^{\circ}\text{C} \pm 0.5\text{ }^{\circ}\text{C}$, followed by GB/T 14454.5 determination.

A.4.3 Calculation of results the value of the specific rotation α_{D}^{20} (20 ° C, D) is expressed by $(^{\circ}) \cdot \text{dm}^2 \cdot \text{kg}^{-1}$, calculated according to the formula (A.2) α_{D}^{20} (20 ° C, D) = $\alpha / l \rho$ (A.2) where.

α - the measured angle of rotation, in degrees ($^{\circ}$);

l - the length of the rotating tube in dm (dm);

ρ - Mass concentration of L-arginine in solution, in grams per milliliter (g/mL).

A.5 Determination of clarity and color Weigh the sample 1.0g, add water 20mL dissolved. Take the water as a control, observe the clarity of the solution on a black background, and view it on a white background Check the color of the solution.

A.6 Determination of pH Weigh the sample 1.0g, add water 20mL dissolved, measured with a pH meter.

A.7 Determination of Chloride A.7.1 Reagents and materials A.7.1.1 nitric acid solution. absorb nitric acid 105mL, diluted with water to 1000mL, shake.

A.7.1.2 Silver nitrate solution. 17.5 g/L.

A.7.1.3 sodium chloride standard solution. weighed sodium chloride 0.165g, accurate to 0.0001g, dissolved in water and diluted to 1000mL, shake, Stock solution. Before use, carefully absorb the stock solution 10mL, diluted with water to 100mL, shake (1mL each equivalent to 10 μ g of Cl).

A.7.2 Analysis steps Weigh the sample 0.10g, set 50mL Na colorimetric tube, add water dissolved 25mL, add nitric acid solution 10mL, add water to about 40mL, shake, get the sample solution. Accurately absorb the standard sodium chloride solution 10.0mL, set 50mL Na colorimetric tube, add nitric acid solution 10mL, add water to about 40mL, shake, the standard solution.

In the sample solution and standard solution, respectively, add 1.0mL of silver nitrate solution, diluted with water to 50mL, shake, placed in the dark 5min, with the same on a

black background, from the top of the color tube down to observe the sample solution of the turbidity should not be greater than the standard solution turbidity.

A.8 Determination of arsenic Weigh the sample 2.0g, add water 23mL dissolved, according to GB/T 5009.11 determination.

A.9 Determination of dry reduction Weigh the sample about 2g, accurate to 0.0001g, according to GB 5009.3 direct drying method.

A.10 Determination of burning residue Weigh the sample about 2g, accurate to 0.0001g, according to GB 5009.4 determination.

Appendix B

Arginine standard infrared spectroscopy Arginine standard infrared spectroscopy, see Figure B.1.

Test preparation. KBr tablet method.

Figure B.1 Arginine standard infrared spectra

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