

CCS X 40



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

GB 1886.75-2016

**National Food Safety Standard -- Food Additives -- L-Cysteine
Hydrochloride**

食品安全国家标准 食品添加剂 L-半胱氨酸盐酸盐

(English Translation)

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1 Scope

This standard applies to livestock and poultry hair, feathers as raw materials by hydrolysis, or starch as raw material by Escherichia coli Escherichia coli K-12 the food additive L-cysteine hydrochloride.

2.1 Chemical name

L-2-amino-3-mercaptopropionate monohydrate L-2-amino-3-mercaptopropionate hydrochloride

2.2 Molecular formula

$C_3H_7NO_2S \cdot HCl \cdot H_2O$ $C_3H_7NO_2S \cdot HCl$

2.4 Relative molecular mass

175.64 A water (according to 2007 International relative atomic mass)

157.62 Anhydrous (according to 2007 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 white State crystalline or crystalline powder Take the appropriate amount of sample in a clean, dry white porcelain dish 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

project

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Water-free

Testing method

L-cysteine hydrochloride content (on a dry basis), w /% 98.5 to 101.0 98.0 to 102.0
 Appendix A, A.3 Specific rotation α_D^{20} (20 °C, D)/[(°) · dm²/kg] 5.5 ~ 7.0 5.6 ~ 8.9
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 acids, w /% ≤ 0.5 0.5 Appendix A. A.12 Iron salt (in terms of Fe)/(mg/kg) ≤ 10.0 10.0
 Appendix A A.13 Heavy metals (Pb)/(mg/kg) ≤ 10 10 Appendix A A.14 Arsenic
 (As)/(mg/kg) ≤ 1.0 1.0 Appendix A A.15 Appendix A Testing method A.1 General
 provisions the reagents and water used in this standard, when not specified in other
 requirements, refer to the analysis of pure reagents and GB/T 6682 provides three levels of
 water. test the standard solution, impurity standard solution, preparation and preparation
 used in the test shall be classified according to GB/T 601, GB/T 602 and 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 of potassium
 bromide, grinding evenly, tablet, recording the infrared spectrum of the sample should be
 with the L-cysteine the standard infrared spectra of the hydrochloride monohydrate are
 consistent, see Appendix B.

A.3 Determination of L-cysteine hydrochloride content (on a dry basis) A.3.1
 Methodological Summary Oxidation of the test sample with iodine as oxidant, and titration
 of the remaining iodine with sodium thiosulfate standard solution, indirect calculation of the
 oxidation sample the amount of iodine consumed, according to the amount of iodine
 consumed by the oxidation sample, and finally calculate the sample content.

A.3.2 Reagents and materials A.3.2.1 Hydrochloric acid solution. 10%.

A.3.2.2 Sodium thiosulfate standard titration solution. 0.1 mol/L.

A.3.2.3 iodine standard titration solution. 0.05 mol/L.

A.3.2.4 Starch indicator. 10 g/L.

A.3.3 Analysis steps Weigh the sample about 0.25g, accurate to 0.0001g, add water 20mL and potassium iodide 4g, shaking dissolved, add hydrochloric acid solution 5mL, Fat belly suction tube by adding iodine standard titration solution 25mL, placed in the dark for 15min, and then placed in an ice bath for 5min, with sodium thiosulfate standard Quasi titration solution titration, near the end point, add starch indicator solution 2mL, continue to titrate to solution blue disappears. At the same time do blank test.

A.3.4 Calculation of results the mass fraction w_1 of the L-cysteine hydrochloride content (on a dry basis) is calculated according to the formula (A.1) $w_1 = c_1 \times (V_1 - V_2) \times M \times 10^{-3} \times 100\%$ (A.1) where.

c_1 --- sodium thiosulfate standard titration solution concentration, the unit is mol per liter (mol/L);

V_1 --- blank consumption of sodium thiosulfate standard titration solution volume, in milliliters (mL);

V_2 --- sample consumption of sodium thiosulfate standard titration solution volume, in milliliters (mL);

M --- L-cysteine hydrochloride in moles per mole (g/mol), [$M(C_3H_7NO_2S \cdot HCl) = 157.6$];

m_1 --- the quality of the sample, in grams (g);

w_2 --- dry weight reduction of sample,%;

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 the value is not greater than 0.3%.

A.4 Determination of specific rotation α_{pham} (20 ° C, D) A.4.1 Instruments and equipment Polarimeter (accuracy $\pm 0.001^\circ$). with sodium light (sodium spectrum D line 589.3nm) as a light source.

A.4.2 Reagents and materials Hydrochloric acid solution. 1mol/L.

A.4.3 Analysis steps Weigh the sample about 8g, accurate to 0.0001g, placed in 100mL volumetric flask, add 1mol/L hydrochloric acid solution dissolved, adjust the solution Temperature to 20 °C, diluted to the mark, shake. With a small amount of this liquid rinse the rotating tube several times, and then slowly into the liquid crystal tube (not to occur Bubble), the rotating tube placed in the polarimeter detection.

A.4.4 Calculation of results the specific rotation of the sample at 20 ° C on the D spectrum of the sodium spectrum α_{pham} (20 ° C, D) is calculated according to the formula (A.2) $\alpha_{\text{pham}} (20^\circ \text{C}, \text{D}) = 100 \times \alpha \times c_2$ (A.2) where.

100 --- conversion factor;

α - optical rotator measured by the optical rotation, the unit is degrees (°);

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

c_2 --- 100mL solution contained in the quality of the measured substance (dry basis), in grams (g).

A.5 Determination of pH Weigh the sample 0.20g, add water 20mL dissolved, measured with a pH meter. The results of two independent determinations obtained under reproducible conditions the difference is not greater than 0.2.

A.6 Determination of chloride (in Cl) A.6.1 Reagents and materials A.6.1.1 nitrobenzene.

A.6.1.2 Hydrogen peroxide. 30%.

A.6.1.3 nitric acid solution. 50mL of nitric acid, diluted with water to 100mL, shake.

A.6.1.4 potassium permanganate solution. 0.01 mg/mL.

A.6.1.5 Silver nitrate standard titration solution. 0.1mol/L.

A.6.1.6 Ammonium thiocyanate standard titration solution. 0.1mol/L.

A.6.1.7 Ammonium Sulfate Indicator.

A.6.2 Analysis steps Weigh the sample about 0.25g, accurate to 0.0001g, add 10mL water and 10mL nitric acid solution dissolved, with fat belly straw to add nitric acid Silver standard titration solution 25mL and potassium permanganate solution 50mL, water bath for 30min, let cool, add hydrogen peroxide solution to solution into no Color, then add ammonium sulfate indicator 8mL and nitrobenzene 1mL, with ammonium thiocyanate titration solution titration. At the same time do blank test.

A.6.3 Calculation of results the mass fraction w_3 of the chloride (in terms of Cl) is calculated according to formula (A.3) $w_3 = c_3 \times (V_3 - V_4) \times M \times 1000 \times 100\%$ (A.3) where.

c_3 - the concentration of ammonium thiocyanate standard titration solution in moles per liter (mol/L);

V_3 --- blank consumption of ammonium thiocyanate standard titration solution volume, in milliliters (mL);

V_4 --- sample consumption of ammonium thiocyanate standard titration solution volume, in milliliters (mL);

M - the molar mass of the chloride ion in grams per mole (g/mol), [$M(\text{Cl}^-) = 35.45$];

m_2 --- the quality of the sample, in grams (g);