



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

GB 1886.9-2016

**National food safety standard - Food additives - Hydrochloric
acid**

食品安全国家标准 食品添加剂 盐酸

(English Translation)

Issued on: August 31, 2016

Implemented on: January 1, 2017

**Issued by: National Health and Family Planning Commission of the
People's Republic of China**

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1 Scope

This document is applicable to the food additive hydrochloric acid synthesized by chlorine and hydrogen and absorbed by water.

2.1 Molecular formula

HCl

2.2 Relative molecular mass

36.46 (according to 2007 international relative atomic mass)

3.1 Sensory requirements

Sensory requirements shall meet the requirements of Table 1.

3.2 Physical and chemical indicators

Physical and chemical indicators shall meet the requirements of Table 2.

Annex A

Inspection methods

A.1 Safety warning

WARNING -- Hydrochloric acid is highly corrosive. Operators shall take appropriate safety and health measures. Contact personnel shall wear protective equipment such as protective glasses and acid-resistant gloves.

Some reagents in this test method are toxic or corrosive. Care shall be taken when handling. If splashed on skin, rinse immediately with water. Severe cases shall be treated immediately.

A.2 General provisions

The reagents and water used in this Standard refer to analytically pure reagents and grade three water specified in GB/T 6682 unless other requirements are specified. The standard solutions used in reagents, standard solutions for impurity determination, preparations and products shall be prepared in accordance with the provisions of GB/T

601, GB/T 602 and GB/T 603 unless other requirements are specified. The solution used in the test refers to the aqueous solution when the solvent is not specified.

A.3.1 Reagents and materials

A.3.1.1 Silver nitrate solution: 2g/L.

A.3.1.2 Ammonia solution: 2+3.

A.3.1.3 Methyl orange indicator solution: 1g/L.

A.3.2 Identification method

A.3.2.1 Measure 1mL of specimen into 50mL of water. Add the silver nitrate solution dropwise, resulting in a white milky precipitate. It can be dissolved in ammonia solution.

It is insoluble in nitric acid.

A.3.2.2 Measure 1mL of specimen into 100mL of water. Add 2 drops of methyl orange solution. The solution turns red. This aqueous solution is strongly acidic.

A.4.1 Method principle

The specimen solution uses bromocresol green as the indicator solution. Titrate with sodium hydroxide standard titration solution until the solution changes from yellow to blue as the end point. The reaction formula is as follows:

A.4.2 Reagents and materials

A.4.2.1 Sodium hydroxide standard titration solution: $c(\text{NaOH})=1\text{mol/L}$.

A.4.2.2 Bromocresol green indicator solution: 1g/L.

A.4.3 Instruments and equipment

A.4.3.1 Conical flask: 100mL (with ground stopper).

A.4.3.2 Burette: 50mL, level A, with 0.1mL division value.

A.4.4.1 Specimen

Measure about 3mL of specimen. Place in a conical flask that contains about 15mL of water and has been weighed (accurate to 0.0001g). Mix and weigh (to the nearest 0.0001g).

A.4.4.2 Determination

Add 2~3 drops of bromocresol green indicator solution to the specimen. Titrate with sodium hydroxide standard titration solution until the solution changes from yellow to blue as the end point.

A.4.5 Result calculation

The mass fraction w_1 of total acidity (calculated as HCl) is calculated according to formula (A.1):

Where,

V - The volume of sodium hydroxide standard titration solution consumed in the titration, in milliliters (mL);

1000 - Conversion factor;

A.5.4.5 Determination

A.5.4.5.1 Add water to the specimen to about 20mL. Use ammonia water to adjust the pH of the solution to 2~3. Then add 1mL of hydroxylamine hydrochloride solution,

5mL of acetic acid-sodium acetate buffer solution and 2mL of 1,10-phenanthroline solution. Use water to dilute to the scale. Shake well. Let stand for 15min.

A.5.4.5.2 Use a suitable cuvette. At the wavelength of 510nm, use a blank solution to adjust the zero point of the spectrophotometer. Measure the absorbance of the solution.

A.5.5 Result calculation

The mass fraction w_2 of iron content (calculated as Fe) is calculated according to formula (A.2):

Where, m_2 - The mass of the specimen, in grams (g);

10⁻⁶ - Conversion factor;

m_3 - The mass of iron in the specimen obtained from the standard curve or calculated by the linear regression equation, in micrograms (μg);

10/100 - Conversion factor.

Take the arithmetic mean of the parallel determination results as the report result. The absolute value of the difference between the parallel determination results is not more than 0.0001%.

A.6.1 Method principle

Evaporate the specimen to dryness. Use hydrochloric acid solution to dissolve the residues. Use glycerol-ethanol mixture as stabilizer. Add barium chloride to make suspension. Use the spectrophotometer to determine the absorbance of the suspension.

A.6.2 Reagents and materials

A.6.2.1 Barium chloride dihydrate ($\text{BaCl}_2 \cdot 2\text{H}_2\text{O}$).

A.6.2.2 Glycerol-ethanol mixture: 1+2.

adjust the zero point of the spectrophotometer. Measure the absorbance of the solution.

A.6.4.1.5 Draw a standard curve or calculate a linear regression equation with the sulfate content (mg) as the abscissa and the corresponding absorbance as the ordinate.

A.6.4.2 Specimen

Weigh about 20g of specimen (accurate to 0.01g). Put in an evaporating dish. Evaporate to dryness on a steam bath. Cool to room temperature. Add 3mL of hydrochloric acid solution to dissolve the residues. Transfer all into a 50mL volumetric flask. Add 5mL of glycerol-ethanol mixture. Use water to dilute to the scale. Shake well.

A.6.4.3 Blank test

No specimen is added. Use the exact same analytical steps, reagents and dosage as the test specimen to carry out the blank test..

A.6.4.4 Determination

A.6.4.4.1 Carefully move the specimen into a dry beaker containing 0.3g of barium chloride dihydrate. Shake for 2min at a speed of 2r/s. At room temperature, let stand for 10min.

A.6.4.4.2 Use a suitable cuvette. At the wavelength of 450nm, use blank solution to adjust the zero point of the spectrophotometer. Measure the absorbance of the solution.

A.6.5 Result calculation

The mass fraction w_3 of sulfate (calculated as SO_4) is calculated according to formula (A.3):