



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

GB 25584-2010

**National food safety standards of food additives magnesium
chloride**

食品安全国家标准 食品添加剂 氯化镁

(English Translation)

Issued on: December 21, 2010

Implemented on: February 21, 2011

Issued by: Ministry of Health of PRC Foreword

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1 Scope

This standard applies to magnesium chloride, a food additive made from bischofite or directly from salt production mother liquor.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document;

for the undated documents, only the latest version (including all the amendments) is applicable to this standard.

3.1 Molecular formula

$\text{MgCl}_2 \cdot n\text{H}_2\text{O}$ ($n = 0, 6$)

3.2 Relative molecular mass

95.20 ($n = 0$) (according to the 2007 international relative atomic mass)

203.3 ($n = 6$) (according to the 2007 international relative atomic mass)

4 Technical requirements

4.1

Sensory requirements

It shall meet the requirements of Table 1.

Table 1 -- Sensory requirements

Item Requirements Inspection methods

Color White Take an appropriate amount of specimen; place it in a 50 mL beaker; observe the color under natural light Organic state Flake or granular crystals

4.2

Physical and chemical indicators

It shall comply with the requirements of Table 2.

Appendix A (Normative)

Test method

A.1 Warning

Some reagents used in the test method of this standard are corrosive, so the operator must be careful! If splashed on the skin, rinse with water immediately; seek medical attention immediately in severe cases. Operations using volatile organic solvents shall be carried out in a fume hood.

A.2 General provisions

The reagents and water used in the test method of this standard, unless otherwise specified, refer to analytical reagents and grade 3 water specified in GB/T 6682-2008.

The standard titration solution, impurity standard solution, preparation and product required in the test, unless otherwise specified, shall be prepared in accordance with the provisions of HG/T 3696.1, HG/T 3696.2, HG/T 3696.3.

A.3 Identification test

A.3.1 Reagents and materials

A.3.1.1 Ammonia solution: 2 + 3.

A.3.1.2 Ammonium chloride solution: 100 g/L.

A.3.1.3 Ammonium carbonate solution: 100 g/L.

A.3.1.4 Silver nitrate solution: 42 g/L.

A.3.1.5 Disodium hydrogen phosphate solution ($\text{Na}_2\text{HPO}_3 \cdot 12\text{H}_2\text{O}$): 160 g/L.

A.3.2 Analytical procedures

A.3.2.1 Identification of magnesium ions

Take about 0.2 g of the specimen; dissolve it in 10 mL of water. No precipitation is produced when adding ammonium chloride solution and ammonium carbonate solution.

When adding disodium hydrogen phosphate solution, a white precipitate shall be produced. Separate the precipitate and add ammonia solution. The precipitate shall not dissolve.

A.3.2.2 Identification of chlorides

Take about 0.2 g of the specimen; dissolve it in 10 mL of water. Add silver nitrate solution to produce a white precipitate. This precipitate is insoluble in nitric acid but soluble in excess ammonia solution.

A.4 Determination of magnesium chloride

A.4.1 Method summary

Use triethanolamine to mask a small amount of trivalent iron, trivalent aluminum, divalent manganese ions. When the pH is 10, use chrome black T as an indicator and titrate the total amount of calcium and magnesium with disodium ethylenediaminetetraacetic acid standard titration solution. Subtract the calcium content from it, to calculate the magnesium chloride content.

A.4.2 Reagents and materials

A.4.2.1 Hydrochloric acid solution: 1 + 1.

A.4.2.2 Triethanolamine solution: 1 + 3.

A.4.2.3 Ammonia-ammonium chloride buffer solution (A) (pH~10).

A.4.2.4 Silver nitrate solution: 10 g/L.

A.4.2.5 Disodium ethylenediaminetetraacetic acid standard titration solution: $c(\text{EDTA}) = 0.02 \text{ mol/L}$.

A.4.2.6 Chrome black T indicator.

A.4.3 Analytical procedure

A.4.3.1 Preparation of test solution A

Weigh about 10 g of the specimen, accurate to 0.000 2 g; place in a 250 mL beaker; dissolve in 20 mL of water. Add 1 mL of hydrochloric acid solution; heat to boiling; keep slight boiling for 1 min ~ 2 min. After cooling, transfer to a 250 mL volumetric flask; dilute to the mark with water; shake well. This solution is test solution A. This solution is retained for the determination of magnesium chloride content and calcium content.

A.4.3.2 Determination

Pipette 25.00 mL of test solution A; place in a 250 mL volumetric flask; dilute to the mark with water; shake well. Transfer 25.00 mL of the above solution into a 250 mL conical flask; add 50 mL of water, 5 mL of triethanolamine solution, 10 mL of ammonia-ammonium chloride buffer solution A, 0.1 g of chrome black T indicator;

titrate with disodium ethylenediaminetetraacetic acid standard titration solution, until the

solution changes from purple-red to pure blue.

c - The accurate value of the concentration of the standard titration solution of disodium ethylenediaminetetraacetic acid, in moles per liter (mol/L);

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

M₂ - The value of the molar mass of magnesium chloride (MgCl₂), in grams per mole (g/mol) (M₂ = 95.20).

The arithmetic mean of the parallel determination results is taken as the determination result; the absolute difference between the two parallel determination results is not greater than 0.1%.

A.5 Determination of calcium

A.5.1 Reagents and materials

A.5.1.1 Sodium hydroxide solution: 100 g/L.

A.5.1.2 Triethanolamine solution: 1 + 3.

A.5.1.3 Disodium ethylenediaminetetraacetic acid standard titration solution: c (EDTA) = 0.02 mol/L.

A.5.1.4 Calcium reagent sodium carboxylate indicator.

A.5.2 Instruments and equipment

Micro-burette: Graduation value is 0.02 mL.

A.5.3 Analytical procedure

Pipette 50.00 mL of test solution A into a 250 mL conical flask; add 30 mL of water and 5 mL of triethanolamine solution; add sodium hydroxide solution dropwise while shaking. When the solution just begins to precipitate, add 0.1 g of calcium reagent sodium carboxylate indicator; continue to add sodium hydroxide solution dropwise until the solution changes from blue to wine red, with an excess of 0.5 mL. Titrate with disodium ethylenediaminetetraacetic acid standard titration solution, until the solution changes from wine red to pure blue.

A.5.4 Calculation of results

Calcium content is calculated as the mass fraction w₃ of calcium (Ca), which is expressed in % and calculated according to formula (A.3):

Where:

V₂ - The volume of disodium ethylenediaminetetraacetic acid standard titration solution consumed by titrating the test solution, in milliliters (mL);