



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

GB 1886.216-2016

**National Food Safety Standard -- Food Additives -- Magnesium
oxide (including heavy and light)**

食品安全国家标准 食品添加剂 氧化镁(包括重质和轻质)

(English Translation)

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1 Scope

This standard applies to basic magnesium carbonate or magnesium hydroxide calcination of food additives made of light magnesium oxide; heavy magnesium carbonate or heavy Magnesium hydroxide calcined prepared by the food additive heavy magnesium oxide.

2.1 Molecular formula

MgO

2.2 Relative molecular mass

40.30 (according to 2013 International Relative Atomic Quality)

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 powder Take the appropriate amount of sample in a 50mL beaker and look under natural light 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

Item Index Test Method Magnesium oxide (MgO, after burning) content, w /% 96.0 ~ 100.5
Appendix A, A.4 Calcium oxide (CaO), w /% ≤ 1.5 Appendix A A.5 Acid insoluble matter, w /% ≤ 0.1 Appendix A A.6 Burning reduction, w /% ≤ 5.0 Appendix A A.7 the free base

was tested in Appendix A, A.8

Table 2 (continued)

Item Index Test Method Soluble salts were tested in Appendix A, A.9 Arsenic (As)/(mg/kg) ≤ 3.0 GB 5009.76 Lead (Pb)/(mg/kg) ≤ 4.0 GB 5009.12 or GB 5009.75 Appendix A Testing method A.1 Warning Some of the reagents used in this test method are corrosive and the operator should be careful to rinse on the skin immediately with water Severe cases should be treated immediately.

A.2 General provisions the reagents and water used in this standard refer to the pure reagent and the tertiary water specified in GB/T 6682 when no other requirements are specified. test the standard titration solution, preparation and products used in the test shall be prepared according to the provisions of GB/T 601 and GB/T 603 when no other requirements are specified.

The solution used refers to an aqueous solution when it is not specified with any solvent formulation.

A.3 Identification test A.3.1 Reagents and materials A.3.1.1 Ammonium chloride.

A.3.1.2 Hydrochloric acid solution. 1 3.

A.3.1.3 Ammonia solution. 2 3.

A.3.1.4 Ammonium carbonate solution..200 g/L. Weigh 20.0 g of ammonium carbonate, dissolve in water, add 20 mL of ammonia, and dilute to 100 mL with water.

A.3.1.5 Sodium phosphate solution. 60 g/L.

A.3.2 Identification method Weigh about 1g sample, dissolved in 25mL hydrochloric acid solution, in the presence of ammonium chloride, the sample solution and the addition of ammonium carbonate solution is not to form a precipitate, continue to add sodium phosphate solution, the formation of insoluble ammonia solution of white crystalline precipitate.

Determination of the content of magnesium oxide (MgO, after burning) A.4.1

Methodological Summary with triethanolamine mask a small amount of trivalent iron, trivalent aluminum and divalent manganese ions, at pH 10, with chromium black T as an indicator, with B Ammonium tetraacetate disodium standard titration solution titration, calculate the amount of calcium and magnesium, from which to reduce the calcium content of magnesium oxide content.

A.4.2 Reagents and materials A.4.2.1 Hydrochloric acid solution. 1 1.

A.4.2.2 Ammonia solution. 1 1.

A.4.2.3 Triethanolamine solution. 1 3.

A.4.2.4 Ammonia - Ammonium chloride buffer solution A (pH ~ 10).

A.4.2.5 Disodium ethylenediamine tetraacetate (EDTA) standard titration solution. c (EDTA) = 0.02 mol/L.

A.4.2.6 Chromium Black T Indicator.

A.4.3 Analysis steps Weigh about 5g sample, accurate to 0.0002g, placed in 250mL beaker, with a small amount of water wetting, adding about 55mL hydrochloric acid solution, Stir until the sample is completely dissolved. Cover the surface dish, boil 3min ~ 5min, after cooling into the 500mL volumetric flask, diluted with water Degree, shake well. This is the sample solution A, for the magnesium oxide content, the determination of calcium oxide content.

Pipette 25mL sample solution A, placed in a 250mL volumetric flask, diluted with water to the mark, shake. Remove from pipette 25mL of the sample solution, placed in 250mL Erlenmeyer flask, add 50mL of water, with ammonia solution to adjust the solution to pH7 ~ 8 (with a wide pH Test paper), add 5mL triethanolamine solution, 10mL ammonia - ammonium chloride buffer solution, 0.1g chromium black T indicator, with ethylenediamine Disodium tetraacetic acid (EDTA) standard titration solution titrated to the solution from purple to pure blue for the end.

A.4.4 Calculation of results the mass fraction w_1 of magnesium oxide (MgO, after burning) is calculated according to formula (A.1) $w_1 = (V_1 - V_2) \times c \times M_1 \div m_1 \times 500 \div 250 \times 1000 \times 100\%$ (A.1) where.

V_1 --- titration of the sample solution consumed by ethylenediamine tetraacetic acid disodium (EDTA) standard titration solution volume in milliliters (mL);

V_2 - A.5.2.5 titration of calcium oxide consumed by the disodium ethylenediamine tetraacetate (EDTA) standard titration solution volume, unit in milliliter (mL);

20 --- conversion factor;

c - the concentration of ethylenediamine tetraacetic acid disodium (EDTA) standard titration solution in moles per liter (mol/L);

M_1 - the molar mass of magnesium oxide in grams per mole (g/mol) [M (MgO) = 40.30];

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

25 --- Remove the volume of sample solution A in milliliters (mL);

500 --- volume of the volumetric flask, in milliliters (mL);

25 --- Remove the volume of the sample solution in milliliters (mL);

250 --- volume of the volumetric flask, in milliliters (mL);

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 Value is not greater than 0.2%.

Determination of Calcium Oxide (CaO) A.5.1 Methodological Summary with triethanolamine to mask a small amount of trivalent iron, trivalent aluminum and divalent manganese ions, at pH 12.5, with calcium reagent sodium carboxylate as an indicator Agent, with ethylenediamine tetraacetic acid disodium standard titration solution titration of calcium ions.

A.5.2 Reagents and materials A.5.2.1 Sodium hydroxide solution. 100 g/L.

A.5.2.2 Triethanolamine solution. 1 3.

A.5.2.3 Disodium Triethylenediamine Tetraacetate (EDTA) Standard titration solution. $c(\text{EDTA}) = 0.02 \text{ mol/L}$.

A.5.2.4 calcium reagent carboxylic acid sodium salt indicator. Weigh 10g at $105^\circ\text{C} \pm 5^\circ\text{C}$ for 2h drying sodium chloride, placed in a mortar, add 0.1g Calcium Reagent Carboxylic acid sodium salt fine, mix well. Placed in a weighing bottle, stored in a dryer. The use period is two months.

A.5.2.5 Analysis steps Remove 50 mL of sample solution A (A.4.3) with a pipette and place in a 250 mL Erlenmeyer flask. Add 30 mL of water, 5 mL of triethanolamine Solution, shake the drop of sodium hydroxide solution, when the solution just precipitated, add 0.1g calcium reagent sodium carboxylate indicator, continue to drop hydrogen Sodium oxide solution to solution from blue to wine red, and excess 0.5mL. Titration of the solution with ethylenediamine tetraacetic acid disodium (EDTA) standard Set the solution from wine red to pure blue for the end.

A.5.3 Calculation of results Calcium oxide (CaO) content of the mass fraction w_2 , according to formula (A.2) calculation.

$$V_2 \times c \times M_2$$

$$500 \times 1000$$

$$\times 100\% \text{ (A.2)}$$

Where.

V_2 - titration of the volume of the standard titration solution of disodium EDTA (EDTA) consumed in the sample solution in milliliters (mL);

c - the concentration of ethylenediamine tetraacetic acid disodium (EDTA) standard titration solution in moles per liter (mol/L);

M_2 - molar mass of calcium oxide in grams per mole (g/mol) [$M(\text{CaO}) = 56.08$];