

ICS 67.020
CCS C 53



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

GB 30614-2014

**National Food Safety Standard -- Food Additives -- Calcium
Oxide**

食品添加剂 氧化钙

(English Translation)

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1 Scope

This standard applies to the use of calcium carbonate burning after the preparation of food additives calcium oxide.

2.1 Molecular formula

CaO.

2.2 Relative molecular mass

56.08 (according to 2011 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 or gray State particles or 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 Calcium oxide (CaO) content (dry basis, mass fraction) /% 95.0 ~ 100.5 Appendix A A.4 Magnesium and alkali metals (mass fraction) /% $\leq$ 3.6 A.5 Inorganic arsenic (in As)/(mg/kg) $\leq$ 3 A.6 Fluorine (F)/(mg/kg) $\leq$ 150 A.7 Lead (Pb)/(mg/kg) $\leq$ 2

A.8 Acid insoluble matter (mass fraction) /% ≤ 1 A.9 Burning reduction (mass fraction) /% ≤ 10 A.10 Appendix A Testing method A.1 Warning Some of the reagents used in the test methods of this standard are toxic or corrosive and should be operated with appropriate safety and protective measures.

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.

Standard solution, preparation and articles for the determination of standard solutions and impurities for testing in this standard are not specified when other requirements are indicated GB/T 601, GB/T 602, GB/T 603. 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 Glacial acetic acid.

A.3.1.2 Ammonium oxalate solution. 35 g/L.

A.3.1.3 Ammonia solution. 2 3.

A.3.1.4 Hydrochloric acid solution. 1 4.

A.3.1.5 methyl red indicator solution.

A.3.2 Identification method Weigh 1g sample, add 20mL of water, add glacial acetic acid to the sample completely dissolved, then add 2 drops of methyl red indicator solution, with ammonia solution Transferred to yellow, and then drop by adding hydrochloric acid solution to make the solution acidic and then add ammonium oxalate solution, which produces a white precipitate. This precipitate is dissolved in hydrochloric acid, and insoluble in glacial acetic acid. With platinum wire dipped in hydrochloric acid soaked calcium salt solution, through the light flame burning brick red.

A.4 Calcium oxide (CaO) content (measured on dry basis) A.4.1 Reagents and materials

A.4.1.1 hydrochloric acid solution. 1 4.

A.4.1.2 Sodium hydroxide solution. 40 g/L.

A.4.1.3 Standard titration solution of disodium ethylenediamine tetraacetate. $c(\text{EDTA}) = 0.02 \text{ mol/L}$.

A.4.1.4 Calcium Carboxylic Acid Sodium Salt Indicator.

A.4.2 Analysis steps Weigh about 0.4g according to A.10 after burning the sample, accurate to 0.0002g. Add 20mL hydrochloric acid solution to completely dissolve, all Department transferred to the 250mL volumetric flask, add water to the mark, shake. Remove the 25 mL sample solution with a pipette and place in a 250 mL Erlenmeyer flask , Add 30mL of water, with 50mL burette accurately add 20mL ethylenediamine tetraacetic acid disodium standard titration solution, shake and then add Into the 15mL sodium

hydroxide solution, 0.3g calcium carboxylate sodium indicator, continue with ethylenediamine tetraacetic acid disodium standard titration solution titrated to dissolved the liquid turns from wine red to pure blue. At the same time as a blank test.

Blank test In addition to the sample, the other types of operation and addition of reagents (except for the standard titration solution) is the same as the assay.

A.4.3 Calculation of results the mass fraction w_1 of calcium oxide (CaO) content is calculated according to formula (A.1) $w_1 = (V_1 - V_0) \times c \times M / 250 \times 25 \times 1000 \times 100\%$ (A.1) where.

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

V_0 --- titration of the blank solution consumed by the disodium ethylenediamine tetraacetate standard titration solution in milliliters (mL);

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

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

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

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

25 --- Remove the volume of the sample solution 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%.

A.5 Determination of magnesium and alkali metals A.5.1 Reagents and materials A.5.1.1 Sulfuric acid.

A.5.1.2 Hydrochloric acid solution. 1 4.

A.5.1.3 Ammonia solution. 1 1.

A.5.1.4 oxalic acid solution. 63 g/L.

A.5.1.5 methyl red indicator solution.

A.5.2 Instruments and equipment Platinum crucible. 100mL.

A.5.3 Analysis steps Weigh about 0.5g of sample, accurate to 0.0002g. Placed in a 250 mL beaker and 15 mL of hydrochloric acid solution was added slowly to the sample Solution, heating and boiling 1min, quickly add 40mL oxalic acid solution and stir, add 2 drops of methyl red indicator solution with ammonia solution to adjust the pH to neutral, heated in a

constant temperature water bath for 1h, cooled and transferred to 100mL volumetric flask, add water to the mark, shake. With a slow filter paper Filter, discard the original filtrate 20mL, with a pipette to remove 50mL filtrate, placed in the $800\text{ }^{\circ}\text{C} \pm 25\text{ }^{\circ}\text{C}$ drying to a constant quality of the platinum crucible, 0.5 mL of sulfuric acid was added, evaporated to dryness on an electric furnace, and then calcined at $800\text{ }^{\circ}\text{C} \pm 25\text{ }^{\circ}\text{C}$ until the mass was constant.

A.5.4 Calculation of results Magnesium and alkali metal content of the mass fraction w_2 according to formula (A.2) calculation.

$$(m_1 - m_2) \times 100$$

$$m \times 50 \times$$

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

Where.

m_1 --- mass of platinum crucible and residue in grams (g);

m_2 --- quality of empty platinum crucible, in grams (g);

100 --- volume of the volume of the bottle, in milliliters (mL);

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

50 --- Remove the volume of the sample solution in milliliters (mL).

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 Value is not greater than 0.2%.

A.6 Determination of inorganic arsenic (calculated as As) Weigh $1.00\text{g} \pm 0.01\text{g}$ sample, add water to completely wet the sample, add hydrochloric acid solution (1 1) to the sample completely dissolved and excessive 2mL, Heated to micro-boiling, cooled as the measured sample solution, in accordance with GB 5009.11 or GB 5009.76 in the provisions of the determination.

A.7 Determination of fluorine (F) Weigh $1.00\text{g} \pm 0.01\text{g}$ sample, add water to completely wet the sample, add hydrochloric acid solution (1 1) to the sample completely dissolved and excessive 2mL, heated to slightly boiling, cooled and completely transferred to 100mL volumetric flask, diluted with water to the mark, shake. Remove 5.00mL above the solution was placed in a 50 mL volumetric flask and the following was carried out as specified in GB/T 5009.18.

A.8 Determination of lead (Pb) Weigh $1.00\text{g} \pm 0.01\text{g}$ sample, add water to completely wet the sample, add hydrochloric acid solution (1 1) to the sample completely dissolved and excessive 2mL, heated to slightly boiling, cooled and completely transferred to 100mL volumetric flask, diluted with water to the mark, shake. According to GB 5009.12 Prescribed