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

GB 25582-2010

**National food safety standards of food additives calcium
silicate aluminum
(English Translation)**

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Table of Contents

Foreword
1 Scope
2 Normative references
3 Molar ratio of components
4 Technical Requirements

Foreword

Appendix A of this standard is a normative appendix.

National Food Safety Standard Food additives calcium aluminum silicate

1 Scope

This standard applies to food additives calcium aluminum silicate water glass is prepared.

2 Normative references

The standard file referenced in the application of this standard is essential. For dated references, only the edition date of the note Apply to this standard. For undated references, the latest edition (including any amendments) applies to this standard.

3 Molar ratio of components

$Al_2O_3/CaO/SiO_2$ molar ratio (molar ratio) is approximately 1. 9.12.

4 Technical Requirements

4.1

Sensory requirements. comply with Table 1.

Table 1 Sensory requirements

Project requires test methods Color white. Take appropriate 50mL sample is placed in a beaker, natural Light to observe the color and texture. State organization powders or granules

4.2

Physical indicators. to comply with Table 2.

Table 2. Physical and chemical indicators

Item Index Test Method Silicon dioxide (SiO_2), w /% 44.0 ~ 50.0 Appendix A A.4 Aluminum oxide (Al_2O_3), w /% 3.0 ~ 5.0 A.5 Appendix A Calcium oxide (CaO), w /% 32.0 ~ 38.0 A.6 in Appendix A Sodium oxide (Na_2O), w /% 0.5 ~ 4.0 A.7 Appendix A Loss on ignition, w /% 14.0 ~ 18.0 Appendix A A.8 Fluorides (as F)/(mg/kg) ≤ 5 Appendix A A.9 Lead (Pb)/(mg/kg) ≤ 5 Appendix A A.10 Arsenic (As)/(mg/kg) ≤ 3 Appendix A A.11 Heavy metals (Pb)/(mg/kg) ≤ 10 Appendix A A.12 Loss on drying, w /% ≤ 10.0 Appendix A A.13 Appendix A (Normative) Testing method A.1 Warning the standard test method requires the use of some of the acid, when used, be careful to avoid splashing on the skin! As splashed on the skin should stand that is rinsed with water, severe cases should be treated immediately. When using a volatile acid, to be carried out in a fume hood.

A.2 General Provisions the standard test methods used in the reagents and water in the absence of other specified requirements, refer to analytically pure reagents and GB/T 6682-2008 in Three water regulations. Test with the standard titration solution, impurity standard solution, preparations and products, did not indicate when the other requirements, according HG/T 3696.1, HG/T 3696.2, the provisions of HG/T 3696.3 of preparation.

A.3 Identification Test A.3.1 Identification of silicate the 0.5 g sample is mixed with 2.5 g of anhydrous potassium carbonate, heated on a hot plate in a platinum crucible to melt the mixture, cooled, 5 mL Water and let stand 3 min, the crucible plus micro heat, add 50 mL of water to dissolve. Completely transferred to a beaker, was added dropwise a solution of hydrochloric acid (11) to airless Bulbs, add 10 mL of hydrochloric acid, evaporated to dryness on a steam bath to cool. Was added 20 mL of water, filtered boiling, insoluble gel residue Used to identify silicon. The filtrate was the test solution A, for the identification of aluminum.

The gelatinous residue was taken platinum crucible, carefully add 5 mL of hydrofluoric acid. The precipitate was dissolved. Heating, placed in the vapor above the crucible A glass rod moistened with a drop of water, the water droplets become cloudy.

A.3.2 Identification of aluminum ions Was added dropwise in the test solutions A (A.3.1) in aqueous ammonia solution (11), a white gelatinous precipitate, addition of excess aqueous ammonia solution, no precipitate Dissolved. Was added dropwise a solution of sodium hydroxide (40 g/L) to give a white gelatinous precipitate, the precipitate dissolved when added in excess.

A.3.3 Identification of calcium ions Take a few samples, hydrochloric acid solution (12) was dissolved phenolphthalein solution (10 g/L) as the indicator solution, (13) adjusted with ammonia solution to neutral, the solution was added ammonium acetate (35 g/L) That is, the white precipitate, this precipitate can be dissolved in hydrochloric acid solution (12), but not dissolved in glacial acetic acid.

A.4 Determination of silica A.4.1 Method summary Silica in the sample with hydrofluoric

acid forming volatile matter by burning volatile, silica calculated by measuring the difference between the mass before and after burning Content.

A.4.2 Reagents and materials A.4.2.1 perchloric acid.

A.4.2.2 hydrochloric acid.

A.4.2.3 sulfuric acid.

A.4.2.4 hydrofluoric acid.

A.4.3 Instruments and Equipment High-temperature furnace. temperature can be maintained at $900\text{ }^{\circ}\text{C} \pm 25\text{ }^{\circ}\text{C}$.

A.4.4 Analysis step

Weigh was $105\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ bake a sample of about 0.5 g 2 h, to the nearest 0.0002 g, into a 200 mL beaker with a small amount of water will Wash the beaker wall. Perchloric acid was added 30 mL and 15 mL hydrochloric acid, in a hood on a hot plate heated until white smoke is generated, added after cooling 15 mL of hydrochloric acid, was again heated to generate white smoke. Evaporated to about 10 mL remaining solution was cooled, 70 mL of water, the use of filter paper, Filter paper and rinse with hot water and precipitation. Keep this filtrate as the filtrate A, for the determination of calcium oxide.

The filter paper and transferred to precipitate a platinum crucible, after a small fire ash, high-temperature oven at $900\text{ }^{\circ}\text{C} \pm 25\text{ }^{\circ}\text{C}$ to constant mass burning, calling it quality. After the residue was wetted with water, 8 drops of sulfuric acid was added followed by 15 mL of hydrofluoric acid, heated on a hot plate to produce white smoke. Steam until nearly dry, After cooling, 5 mL of water, 3 drops of sulfuric acid and 10 mL of hydrofluoric acid, hot plate evaporation to near dryness on a hot plate heated to white smoke Catch net. The crucible and then calcined at $900\text{ }^{\circ}\text{C} \pm 25\text{ }^{\circ}\text{C}$ in to a constant quality. The mass loss after hydrofluoric acid is added in a sample of silica substance the amount. Keep this residue B for the determination of aluminum oxide.

A.4.5 Calculation Results Silica content of silicon dioxide (SiO_2) mass fraction w_1 and its value is expressed in%, according to formula (A.1) Calculated.

$0.211 \times - = m$

mmw (A.1)

Where.

1m - for the first time after a constant burning quality to value the quality of the crucible and precipitate in grams (g);

2m - the second (after adding the hydrofluoric acid treatment) value to the quality of constant quality after burning crucible and precipitate in grams (g);

m - mass of the sample value in units of grams (g).

Take the arithmetic mean of the parallel determination results of the measurement results, the results of two parallel determination of the absolute difference is not more than 0.1%.

A.5 Determination of aluminum oxide A.5.1 Reagents and materials A.5.1.1 potassium pyrosulfate.

A.5.1.2 ammonia.

A.5.1.3 hydrochloric acid. 11.

A.5.1.4 ammonium chloride solution. 20 g/L.

A.5.1.5 bromine thymol blue indicator solution. 1 g/L.

A.5.2 Analysis step

The residue B (A.4.4) after the determination of silicon dioxide and 2 g of potassium pyrophosphate to constant mass burning placed a platinum crucible at a high temperature furnace Gradually warming to $650\text{ }^{\circ}\text{C} \pm 25\text{ }^{\circ}\text{C}$ melt 5 min ~ 10 min. Cooling, hydrochloric acid solution, 20 mL, micro heat leaching and dissolved frit, finished Full transferred to a 500 mL beaker, into a beaker with hot water wash lotion and a platinum crucible. Diluted with water to 350 mL ~ 400 mL, was added 5 drops of bromine thymol blue indicator solution, heated to a boil, remove, cooling, dropping ammonia until the blue appears, boil 5 min, the removal of ammonia.

Quantitative filter paper, and 6 parts of hot ammonium chloride solution and rinse the filter precipitate, the filter paper and precipitate transferred to a platinum crucible at $900\text{ }^{\circ}\text{C} \pm 25\text{ }^{\circ}\text{C}$ Burning to a constant quality.

A.5.3 Calculation Results Aluminum oxide content of aluminum oxide (Al_2O_3) mass fraction w_2 and its value is expressed in%, according to formula (A.2) Calculated.

$0.212 \times \frac{m}{m_{\text{mmw}}} = m$

mmw (A.2)

Where.

1m - value quality at $900\text{ }^{\circ}\text{C} \pm 25\text{ }^{\circ}\text{C}$ to constant mass burning platinum crucible and precipitate in grams (g);

2m - Numerical platinum crucible mass in grams (g);

m - sample mass (A.4.4) value in units of grams (g).

Take the arithmetic mean of the parallel determination results of the measurement results, the results of two parallel determination of the absolute difference is not more than 0.1%.

A.6 Determination of calcium oxide A.6.1 Reagents and materials A.6.1.1 sodium hydroxide