



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

GB 1903.14-2016

Replacing GB 17203-1998

Food additive -- Calcium citrate

食品安全国家标准 食品营养强化剂 柠檬酸钙

(English Translation)

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Foreword

This standard replaces GB 17203-1998 "Food Additives calcium citrate." Compared with this Standard GB 17203-1998, the main changes are as follows.

--- standard name was changed to "national food safety standards of food nutrition fortifier calcium citrate";

--- modify the sensory requirements;

--- modified calcium citrate content (dry basis), sulfate reduction, the indicator lead (Pb); and

--- remove heavy metals (as Pb), acid insolubles, the solution was clear indicators of the requirements and test methods;

--- modify the identification of test methods;

--- Loss on drying test method references corresponding national standards;

--- part of the standard test method references adjusted to the latest released version.

National Food Safety Standard Fortified Food calcium citrate

1 Scope

This standard applies to food fortifier calcium citrate with citric acid to calcium carbonate (or calcium oxide, calcium hydroxide) formed by the reaction.

2.1 Chemical Name

2-hydroxy-1,2,3-tricarboxylic acid, calcium tetrahydrate

2.2 Structure

Formula 2.3

$\text{Ca}_3 (\text{C}_6\text{H}_5\text{O}_7)_2 \cdot 4\text{H}_2\text{O}$

2.4 Molecular Weight

570.50 (according to 2011 international relative atomic mass)

3.1 Sensory requirements

Sensory requirements shall comply with the requirements in Table 1.

Table 1 Sensory requirements

Project requires test methods Color White State crystal or crystalline powder Proper amount of sample is placed in a clean, dry porcelain dish, which was observed under natural light color Chak 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 citrate content (dry basis), w /% 97.5 ~ 100.5 Appendix A
A.3 Drying loss, w /% 10.0 ~ 14.0 GB 5009.3 a direct drying method Fluoride/(mg/kg) ≤ 30
Appendix A A.4 Lead (Pb)/(mg/kg) ≤ 2.0 GB 5009.75 or GB 5009.12 Arsenic (As)/(mg/kg) ≤ 3.0 GB 5009.76 a drying temperature of 150 °C, drying time was 4h.

Appendix A

Testing method

A.1 General Provisions at time of the reagents in water and does not indicate other requirements, refer to three analytical reagent water and GB/T 6682 provisions. Test when the standard solution, the standard solution, the determination of impurities, formulations and articles not indicate other requirements, are by GB/T 601, GB/T 602 and GB/T 603 Preparation predetermined. The test does not indicate when the solution which is formulated with a solvent, refer to the aqueous solution.

A.2 Identification Test A.2.1 solubility test Samples slightly soluble in water, insoluble in ethanol.

A.2.2 precipitation reaction A.3.1.5 disodium edetate standard titration solution. c (EDTA-2Na) = 0.05mol/L.

A.3.2 Analysis step

Accurately weighed 0.35g ~ 0.40g previously dried at 150 deg.] C to constant weight of the sample, to the nearest 0.0001g, was added 10mL of water and 2mL hydrochloric acid solution, dissolved diluted with water to 100mL, plus 15mL 5mL triethanolamine and sodium hydroxide solution, shake.

With sodium hydroxide solution to adjust pH > 13, about 0.1g calcium indicator was added, with disodium edetate standard solution was titrated to a purple solution Pure red to blue as the end point.

A.3.3 calculation results Calcium citrate content (dry basis) the mass fraction w_1 , calculated according to formula (A.1).

$c \times V \times M$

$m \times 1000 \times$

100% (A.1)

Where.

C --- disodium edetate actual concentration of standard titration solution in units of moles per liter (mol/L);

V --- consumption volume disodium edetate standard titration solution in milliliters (mL);

--- molar mass M calcium citrate, units of grams per mole (g/mol) $\{M [3Ca3 (C_6H_5O_7) 2] = 166.17\}$;

--- m sample mass in grams (G);

1000 --- volume conversion factor.

The test result to the arithmetic mean of replicates results. Obtained in two independent determination results under repeatability conditions of absolute difference Value is not greater than 0.5% of the arithmetic mean.

A.4 Determination of fluoride A.4.1 Reagents and materials A.4.1.1 perchloric acid.

A.4.1.2 thorium nitrate solution. Weigh thorium nitrate 250mg, add water to dissolve and dilute to volume 1000mL.

Alizarin sulfonate solution A.4.1.3. 1 -> 1000.

A.4.1.4 sodium hydroxide solution. Weigh 0.2g of sodium hydroxide, dissolved in water and diluted to volume 1000mL.

Hydrochloric acid solution A.4.1.5. amount of 0.83mL of hydrochloric acid, diluted with water to a volume 100mL.

A.4.1.6 fluoride standard solution. 105 °C dried precision learn 1h 22.1 mg sodium fluoride, set 100mL volumetric flask, add water-soluble Solution and dilute to volume, shake; precise amount of 10mL, set another 100mL volumetric flask, dilute to volume with water and shake. The solution per Equivalent to 10µg of the fluorine-containing 1mL.

A.4.2 Instruments and Equipment A.4.2.1 distillation fluoro measuring apparatus (see Figure A.1).

A.4.2.2 colorimetric tube. 50mL.

Description.

1 --- steam generator (1000mL flask);

Tube 2 --- security (f5mm);

3 --- glass tube (phi5mm);

4 --- rubber stopper;

5 --- tee and screw clamp;

6 --- thermometer (200 °C);

7 --- three bottles (250mL);

8 --- glass bending;

--- straight condenser. 9 (500mm);

10 --- glass bending;

11 --- volumetric flask;

12 --- heating jacket or an electric furnace;

13, 14 --- rubber stopper.

A.1 distillation measuring means fluoro schematic diagram A.4.3 Analysis step 2.0 g of a sample was weighed (accurate to 0.1 g of), 250mL three-necked flask was placed (see Figure A.1), plus 10 to 20 glass beads, slowly add Into 5mL perchloric acid, rinsed with 15mL water bottle wall. Good thermometer and glass tops in three bottles and glass balls and mercury thermometer Bottle three tubes are inserted in the test solution, according to the measured fluoro schematic three bottles are connected with the steam generator and condenser straight, in the steam generator 500mL of water was added, open screw clamp, heated to boiling, screw clamp closed, the water vapor into the three-neck flask, three bottles of liquid by an electric furnace Holder at 135 °C ~ 140 °C, until about 70mL distillate distillation was stopped. Distillate was diluted with water to 80 mL, mix, pipetted 40mL