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

GB 8820-2010

Replacing GB 8820-1988

**National food safety standards of food additives -- Zinc
gluconate**

(English Translation)

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Foreword

This standard replaces GB 8820-1988 "food additive zinc gluconate." this standard compared with GB 8820-1988, the main changes are as follows.

- Test method to modify the differential response (2) of the sample volume;
- Increasing the pH indicator and test methods;
- Modify the test method for determination of chloride;
- Modify the test method for determination of sulphate;
- Cancel the moisture determination of Fischer titration;
- Modify the technical requirements for the moisture loss on drying;
- Modify the test method for reducing substances;
- Cadmium (Cd) is amended as indicators by the $\leq 0.0005\%$ ≤ 2 (mg/kg);
- Lead (Pb) is amended as indicators by the $\leq 0.001\%$ ≤ 3 (mg/kg).

Appendix A of this standard is a normative appendix.

This standard replaces the standards previously issued as follows.

--GB 8820-1988.

National Food Safety Standard Food additive zinc gluconate

1 Scope

This standard applies to calcium gluconate as a starting material, by acidification or reaction with zinc compound to gluconolactone and zinc as a raw material Compounds obtained by the reaction of zinc gluconate food additives.

2 Normative references

The standard file referenced in the application of this standard is essential. For cited documents with dates, only the date of Version applies to this standard. For undated references, the latest edition (including any amendments) applies to this standard.

3.1 Chemical Name

D- zinc gluconate

Formula 3.2

C₁₂H₂₂O₁₄Zn

3.3 Formula

HOH₂C C

COO

Zn 2

3.4 Relative molecular mass

455.70 (according to 2007 international relative atomic mass)

4 Technical Requirements

4.1

Sensory requirements. comply with Table 1.

Table 1 Sensory requirements

Project requires test methods White or white color proper amount of sample is placed in a clean, dry white porcelain dish, natural Light, observe its color and texture. Organization status particles or crystalline powder

4.2

Physical indicators. to comply with Table 2.

Table 2. Physical and chemical indicators

Item Index Test Method Zinc gluconate ($C_{12}H_{22}O_{14}Zn$, dry basis), w /% 97.0 ~ 102.0
 Appendix A A.4 Chloride (Cl dollars), w /% ≤ 0.05 Appendix A A.5 Sulfate (SO_4 dollars), w /% ≤ 0.05 GB/T 9728 Reducing substance (in $C_6H_{12}O_6$ dollars), w /% ≤ 1.0 A.6 in
 Appendix A Loss on drying, w /% ≤ 11.6 Appendix A A.7 Arsenic (As)/(mg/kg) ≤ 3
 Appendix A A.8 pH (10.0g/L solution) 5.5 ~ 7.5 GB/T 9724 Cadmium (Cd)/(mg/kg) ≤ 2
 Appendix A A.9 Lead (Pb)/(mg/kg) ≤ 3 GB 5009.12 Appendix A (Normative) Testing
 method A.1 Safety Tips Reagents The standard test methods used for toxic or corrosive,
 according to the relevant provisions of the operation, should be used with caution.

If splashed on the skin should immediately wash 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 Unless otherwise indicated in the analysis using only confirm three analytical grade reagents and water GB/T 6682-2008 stipulated.

Test Methods standard titration solution, when measured impurity standard solution, preparations and products, with no other requirements noted, According to GB/T 601, GB/T 602, GB/T 603 provisions of the preparation.

A.3 Identification Test A.3.1 Reagents and materials A.3.1.1 potassium ferrocyanide solution. 100g/L.

A.3.1.2 hydrochloric acid solution. 14.

A.3.1.3 phenylhydrazine.

A.3.1.4 glacial acetic acid.

A.3.2 Identification Test A.3.2.1 Identification of zinc A.3.2.1.1 Method summary Potassium ferrocyanide test solution is reacted with zinc to form a white precipitate, insoluble precipitate in dilute hydrochloric acid, thereby discriminating zinc ions.

A.3.2.1.2 analysis step Weigh 1.0 g laboratory samples, accurate to 0.01 g, placed in 50 mL test tube, add 20 mL of water to dissolve, if necessary, heating Dissolution, Gaja iron potassium cyanide solution, which occurred in a white precipitate, separation, precipitation not dissolved in dilute hydrochloric acid.

A.3.2.2 Identification of glucose A.3.2.2.1 Method summary Sample in acetic acid medium, and phenylhydrazine were hot, a yellow crystalline glucose acid phenylhydrazine.

A.3.2.2.2 analysis step Weigh 0.5 g laboratory samples, accurate to 0.01 g, add 10 mL of water, was dissolved (heating if necessary), take 5 mL, add 0.7 mL Glacial acetic acid and 1 mL of freshly distilled phenylhydrazine, in a water bath heated 30min, to room temperature, the inner wall of the tube with a glass rod friction, the yellow precipitate Colored crystals.

A.4 Determination of zinc gluconate A.4.1 Method summary Chrome black T as indicator, with disodium edetate standard sample solution droplets given titration according disodium

edetate the amount of standard titrant, calculate the content of $C_{12}H_{22}O_{14}Zn$ meter zinc gluconate.

A.4.2 Reagents and materials A.4.2.1 ammonia - ammonium chloride buffer solution (pH~10).

A.4.2.2 chrome black T indicator.

A.4.2.3 disodium EDTA standard titration solution. $c(EDTA) = 0.05 \text{ mol/L}$.

A.4.3 Analysis step

Weigh 0.5 g laboratory samples, accurate to 0.000 1 g, add 100 mL of water to dissolve (heating if necessary), put to room temperature, 5 mL ammonia - ammonium chloride buffer solution, a little chrome black T indicator, using disodium edetate standard solution titration until the solution changed from purple Pure blue, and titration with blank test correction, per 1 mL of edetate disodium titrant (0.05 mol/L) is quite to 22.78 mg of $C_{12}H_{22}O_{14}Zn$.

A.4.4 Calculation Results Zinc gluconate (to $C_{12}H_{22}O_{14}Zn$ meter) mass fraction w_1 , expressed in%, according to equation (A.1) Calculated.

() 100%

(1) 1000

$VV c M_w$

- $x x = xx - x$ (A.1) where.

$V--$ laboratory sample consumption disodium edetate standard titrant volume values in milliliters (mL);

V_0 empty - white test consumption value disodium edetate standard titrant volume in milliliters (mL);

$c B$ - tetraacetic acid disodium titrant concentration standard value in units of moles per liter (mol/L);

Numerical m_1-- laboratory sample mass, in grams (g);

w_3 is --A.7 measured the mass fraction of the loss on drying of laboratory samples, values expressed by%.

Numerical $M--$ zinc gluconate ($C_{12}H_{22}O_{14}Zn$) molar mass in grams per mole (g/mol) ($M = 455.70$).

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 0.2%.

A.5 Determination of chloride A.5.1 Reagents and materials A.5.1.1 nitric acid solution. 25 -> 100.