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

GB/T 5413.21-1997

Replacing GB/T 5413.21-1997

**National food safety standard -- Determination of calcium, iron,
zinc, sodium, potassium, magnesium, copper and manganese
in foods for infants and young children, milk and milk products**
(English Translation)

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Table of Contents

Foreword

1 Scope

2 Normative references

3 Chemical name, molecular formula, molecular mass and structural formula

3.1 Chemical Name

3.3 Formula

3.4 Relative molecular mass

4 Technical Requirements

Foreword

The Standard Annexes A and B are normative appendix.

GB 25550-2010

National Food Safety Standard Food additives L- carnitine tartrate

1 Scope

This standard applies to food additives L- carnitine and tartaric acid for the synthesis of food additives L- carnitine tartrate.

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

(R) - bis [(3-carboxy-2-hydroxypropyl) trimethyl amino] -L-tartrate Formula 3.2
C₁₈H₃₆N₂O₁₂

3.4 Relative molecular mass

472.49 (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 Color White take appropriate laboratory sample, placed in a clean, dry white porcelain dish, in natural light, visually observed. Organizational status crystalline powder

4.2

Physical indicators. to comply with Table 2.

GB 25550-2010

Table 2. Physical and chemical indicators

Item Index Test Method L- carnitine (dry basis), w /% 68.2 ± 1.0 in Appendix A A.4 Tartaric acid (dry basis), w /% 31.8 ± 1.0 in Appendix A A.5 Loss on drying, w /% ≤ 0.5 A.6 in Appendix A Residue on ignition, w /% ≤ 0.5 Appendix A A.7 pH (100g/L aqueous solution) 3.0 to 4.5 Appendix A A.8 Specific rotation $\alpha_D(20^\circ)$ $[-11.0 \sim -9.5]$ Appendix A A.9 in Appendix A Arsenic (As)/(mg/kg) ≤ 1 Appendix A A.10 Heavy metals (Pb)/(mg/kg) ≤ 10 Appendix A A.11 GB 25550-2010 Appendix A (Normative) Testing method A.1
Warning Some test procedures prescribed test method can lead to dangerous situations. The operator shall take appropriate safety and health practices.

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, the provisions of GB/T 602 and GB/T 603 of the preparation.

A.3 Identification Test A.3.1 chemical A.3.1.1 Reagents and materials A.3.1.1.1 glycerol.

Carbon disulfide solution A.3.1.1.2 sulfur. 20g/L. Take sulfur 2g, plus carbon disulfide to dissolve into a 100mL.

A.3.1.1.3 lead acetate paper. take lead acetate 10g, plus a new boiling over cold water to dissolve, dropping ice acetic acid solution is clarified, then the new Boiling over cold water to dilute to 100mL, take the filter paper dipped in lead acetate test solution, after removing the soaked, dried at 100°C .

A.3.1.2 analysis step Weigh about 50mg laboratory samples, placed in a test tube, add one drop of solution of sulfur in carbon disulfide, mixed, heated moment, in the dry Tube mouth covered with lead acetate paper, the tubes were suspended in preheated to about 170°C

glycerol bath, 3min ~ 4min after the paper appears black spot.

A.3.2 Infrared Spectroscopy by IR potassium bromide tablet method, samples were taken and controls 1mg ~ 2mg and potassium bromide, potassium bromide. Sample = 100. 1, Respectively, mixing and grinding evenly into tableting machine, the film into the infrared spectrometer to obtain infrared spectra. Its spectrum should Appendix B in Figure B.1 L- carnitine tartrate IR spectra consistent standard.

Determination A.4 L- carnitine A.4.1 Method summary Sample with glacial acetic acid as solvent, crystal violet as indicator, titration with perchloric acid standard solution titration, perchloric acid consumption according to standards Volume of titrant, calculate the content of L- carnitine.

A.4.2 Reagents and materials A.4.2.1 glacial acetic acid.

A.4.2.2 perchloric acid standard titration solution. $c(\text{HClO}_4) = 0.1\text{mol/L}$.

A.4.2.3 crystal violet indicator solution. 5g/L.

A.4.3 Analysis step

A.4.3.1 weighed sample 0.1g, accurate to 0.0001g, ice acetic acid 20mL dissolved, add a drop of crystal violet indicator solution with perchloric acid Standard titration solution titrated to a solution of pure blue.

GB 25550-2010

A.4.3.2 measured at the same time, according to the same procedure and the determination of the sample without using the same amount of reagent blank test solution.

A.4.4 Calculation Results L- carnitine ($\text{C}_7\text{H}_{15}\text{NO}_3$, dry basis) of the mass fraction w_1 , expressed in%, according to equation (A.1) Calculated.

) 10001 (

M_{cVw} (A.1)

Where.

V_1 -- sample consumption of perchloric acid standard titration solution (A.4.2.2) the value of the volume, in milliliters (mL);

V_2 -- blank consumption value perchloric acid standard titration solution volume in milliliters (mL);

Accurate c_1 -- perchloric acid standard titration solution concentration value in units of moles per liter (mol/L);

m -- sample mass value in grams (g);

w_3 - A.6 measured by loss on drying,%;

M - molar mass values of L- carnitine, expressed in grams per mole (g/mol) (M = 161.2).

The arithmetic average of the results of two parallel determination for reporting results. Two parallel determination results is not more than 0.3% absolute difference.

A.5 Determination of tartaric acid A.5.1 Reagents and materials A.5.1.1 sodium hydroxide standard titration solution. c (NaOH) = 0.1mol/L.

A.5.1.2 phenolphthalein indicator solution. 10g/L.

A.5.2 Analysis step

Weigh the sample 0.3g, accurate to 0.0001g, placed in 250mL conical flask, freshly boiled and cooled water to dissolve 50mL, Add 2 drops of phenolphthalein indicator solution, titration with sodium hydroxide standard solution titration solution from colorless to pink.

A.5.3 Calculation Results Tartaric acid (C₄H₆O₆, dry basis) of the mass fraction w₂, expressed in%, according to equation (A.2) Calculated.

M 100

(1) 1000

V_{cw}

Where.

V₁-- sample consumption of sodium hydroxide standard titration solution (A.5.1.1) the value of the volume, in milliliters (mL);

Accurate c₂-- sodium hydroxide concentration value in units of moles per liter (mol/L);

m-- sample mass value in grams (g);

w₃ - A.6 measured by loss on drying,%;

M-- numerical molar mass of tartaric acid, in units of grams per mole (g/mol) (M = 75.04).

The arithmetic average of the results of two parallel determination for reporting results. Two parallel determination results is not more than 0.3% absolute difference.

A.6 Determination of loss on drying According to GB/T 6284 carried out. Measured, weighed 1g ~ 2g laboratory samples, accurate to 0.0001g.

The arithmetic average of the results of two parallel determination for reporting results. Two parallel determination results is not more than the absolute difference between the two measurements GB 25550-2010 20% of the arithmetic mean of the set value.

A.7 Determination of residue on ignition According to GB/T 9741 carried out. Ignition temperature (750 ± 50) °C.

The arithmetic average of the results of two parallel determination for reporting results. Two