

ICS 67.100.10
CCS C 53;X82



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

GB/T 5413.24-1997

Replacing GB/T 5413.24-1997

**National food safety standard -- Determination of chlorine in
foods for infants and young children, milk and milk products
(English Translation)**

Issued on: March 26, 2010

Implemented on: June 1, 2010

Issued by: Ministry of Health of the People's Republic of China

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Foreword

This standard replaces GB/T 5413.24-1997 "infant formula and milk powder - Determination of chlorine." this standard replaces the standards previously issued as follows.

--GB 5413-1985, GB/T 5413.24-1997.

National Food Safety Standard Determination of infant foods and dairy products of chlorine

1 Scope

This standard specifies the infant food and dairy products Determination of chlorine.

This standard applies to food and dairy products Determination of chlorine in infants.

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.

The first potentiometric titration method Principle 3 Samples treated by acidification, acetone was added to the glass electrode as the reference electrode, silver electrode as indicator electrode with standard silver nitrate titration solution Titration test solution of chloride ions, according to the potential of the "jump" to determine the titration end point. Press the consumption standard silver nitrate titration solution, calculation test the chlorine content of the sample.

4 Reagents and materials

Unless otherwise specified, the reagents used in this method are analytically pure water GB/T 6682 provisions of secondary water.

4.1

potassium ferrocyanide ($K_4Fe(CN)_6 \cdot 3H_2O$).

4.2

zinc acetate ($Zn(CH_3COO)_2$).

4.3

Glacial acetic acid (CH_3COOH).

4.4

nitric acid (HNO_3).

4.5

acetone (C_3H_6O).

Sodium chloride 4.6 standard ($NaCl$).

4.7

standard silver nitrate ($AgNO_3$).

4.8 Protein precipitant

4.8.1

precipitant I. Weigh 106 g of potassium ferrocyanide (4.1), dissolved in water and transferred to a 1000 mL volumetric flask, dilute with water to Scale.

4.8.2

precipitant II. Weigh 220 g zinc acetate (4.2), dissolved in water and added to 30 mL of glacial acetic acid (4.3), transfer to a 1000 mL Volumetric flask, dilute to the mark.

4.9 nitric acid solution (13). 1 by volume nitric acid (4.4) with 3 volumes of water and mix.

4.10 sodium chloride standard solution (0.01 mol/L). Weigh 0.5844 g after 500 °C ± 50 °C drying to constant weight sodium chloride standard (4.6), in 100 mL beaker with a small amount of water dissolved and transferred to a 1000 mL volumetric flask, dilute to the mark.

4.11 Standard silver nitrate titration solution (0.02 mol/L)**4.11.1**

preparation. Weigh 3.40 g (accurate to 0.01 g) of silver nitrate standard (4.7), in 100 mL beaker with a small amount of water to dissolve After the transfer to a 1000 mL volumetric flask with water to volume, shake, dark storage, or transferred to a brown volumetric flask.

4.11.2

Calibration (second derivative). lessons 10.00 mL sodium chloride standard solution (4.10) in 50 mL beaker, was added 0.2 mL Nitric acid (4.4) and 25 mL of acetone (4.5). The glass electrode and a silver electrode immersed in the solution, start the magnetic stirrer.

V dropped ml standard silver nitrate titration solution (90% of the required amount) from the burette, the solution was measured potential value (E). Continue to trickle Standard silver nitrate titration solution, each solution was measured immediately dropped 1 mL potential value (E). Close to the end and after the end of each solution of 0.1 mL Solution potential measured value (E). Continue to trickle standard silver nitrate titration solution until the solution is no longer the potential value change significantly. Table 1 Example Format recording volume value and potential value of the standard silver nitrate titration solution per instillation.

4.11.3

titration end point is determined. according to titration record (4.11.2), by volume, value (V) standard silver nitrate titration solution and the potential Value (E), by way of the list in Table 1 illustrates the calculation of ΔE , ΔV , a derivative and secondary derivative value included in the table.

Example 1 table records the standard silver nitrate titration solution of sodium chloride standard solution titration VE ΔE_a ΔV_b first derivative ($\Delta E/\Delta V$) two derivative

400	0.00	70	18	4.00	470	4.00	twenty two	20	0.5	40	4.50	49060	10	100	0.1	4.60	50050	15
0.1	150	4.70	51550	20	200	0.1	4.80	535	650	85	0.1	850	4.90	620-350	50	500	0.1	5.00
670-300	20	200	0.1	5.10	690-100	10	100	0.1	5.20	700	-	-	-	-	-	-	-	-

-Potential changes in the value of a corresponding.

b continuous trickle standard silver nitrate titration solution volume increase value.

Potential changes in the value of c per unit volume of standard silver nitrate titration solution caused that ΔE and ΔV ratio.

d difference values of adjacent first derivative equivalent.

When the first derivative maximum, when two derivative equal to zero, is the titration end point, when according to formula (1) calculate the standard silver nitrate titration endpoint titration solution Volume (V_1) solution.

$\Delta V = V_b - V_a$

$\Delta V = a_1 (1)$

Where.

V_1 - value consumed titration end point standard silver nitrate titration solution volume in milliliters (mL);

ΔV - consumption volume of the standard silver nitrate titration solution at a time, in milliliters (mL);

a_1 - two two derivative zero before;

b_1 - two two derivative value is zero after;

Numerical ΔV --a and b, in milliliters (mL).

Example.

Find the first derivative maximum value from the table 850, the secondary derivative equal to zero should be between 650 and -350, so $a = 650$, $b = -350$, $V = 4.8$ mL, $\Delta V = 0.10$ mL.

$(\Delta V) = 87.4065.08.410.0350650 6508.41 = =]] [[x - = ((())) \Delta V = V_b - V_a \Delta V = a_1 (mL)$ that is when the titration end point, the amount of the standard silver nitrate titration solution of 4.87 mL.

(2) Calculation 4.11.4 standard silver nitrate titration solution concentration according to the formula.

10cc

Where.

The exact value of c_2 -- standard silver nitrate titration solution, expressed in moles per liter (mol/L);

C_1 -- exact concentration of sodium chloride solution reference value, in units of moles per liter (mol/L);