



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

GB 5009.44-2016

**National food safety standard Determination of chloride in
foods**

(English Translation)

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Table of Contents

Foreword...	4
1 Scope...	5
2 Principles...	5
3 Reagents and materials...	5
4 Instruments and apparatuses...	8
5 Analysis procedures...	8
6 Analysis result representation...	11
7 Precision...	12
8 Others...	12
9 Principles...	12
10 Reagents and materials...	12
11 Instruments and equipment...	15
12 Analysis procedures...	15
13 Analysis results representation...	16
14 Precision...	17
15 Others...	17
16 Principles...	17
17 Reagents and materials...	18
18 Instruments and equipment...	19
19 Analysis procedures...	19
20 Analysis result representation...	20
21 Precision...	21
22 Others...	21

Foreword

This standard replaces GB 5413.24-2010 "National food safety standard - Determination of chlorine in foods for infants and young children, milk and milk products", GB/T 12457-2008 "Determination of sodium chloride in foods", GB/T 15667-1995 "Fruits, vegetables and their products - Determination of chloride content", GB/T 9695.8-2008 "Meat and meat products - Determination of

chloride content", GB/T 22427.12-2008 "Starches and derived products - Determination of chloride content", AND the determination of "14.2 Salt" in GB/T 5009.44-2003 "Method for analysis of hygienic standard of meat and meat products".

This standard will integrate the above standards, with the main modifications are as follows.

- MODIFY the standard name into "National food safety standard - Determination of chloride in foods";
- Based on the principle of chloride determination, three methods are integrated. potentiometric titration method, Volhard method (indirect precipitation titration method), AND argentometric method (moles method or direct titration method);
- DELETE the original methods of determination based on food category;
- ADD the sonication procedures.

National food safety standard

Determination of chloride in foods

1 Scope

This standard specifies determination methods of chloride in foods by the potentiometric titration method, the Volhard method (indirect precipitation titration method), AND the argentometric method (moles method or direct titration method).

The potentiometric titration method of this standard is applicable to the determination of chloride in various types of foods.

The Volhard method (indirect precipitation titration method) and the argentometric method (the moles or direct titration method) of this standard do not apply to the determination of chloride in deep-color foods.

Method I. Potentiometric titration method

2 Principles

After the sample was acidified, ADD acetone; USE the glass electrode as the reference electrode AND the silver electrode as the indicator electrode. USE the silver nitrate standard titration solution to titrate the chloride in the test solution. Based on the "jump" of the potential, DETERMINE the titration end point. Based on the consumption of the silver nitrate standard titration solution, CALCULATE the chloride content in the food.

3 Reagents and materials

Unless otherwise indicated, the reagents used in this method are of analytical pure AND the water is level III water as specified in GB/T 6682.

3.3.1 Precipitant I. WEIGH 106 g of potassium ferrocyanide; ADD water to dissolve it and make its volume reach to 1 L; MIX it uniformly.

3.4.2 Silver nitrate standard titration solution (0.02 mol/L). WEIGH 3.40 g of silver nitrate (accurate to 0.01 g) into a small beaker; USE a small amount of nitric acid to dissolve it; TRANSFER it into a 1000 mL brown volumetric flask; USE water to make it reach to the volume; SHAKE to make it uniform;

3.4.3 Calibration (second derivative method). PIPETTE 10.00 mL of 0.01000 mol/L sodium chloride reference solution into a 50 mL beaker; ADD 0.2 mL of nitric acid solution and 25 mL of acetone. IMMERSE the glass electrode and the silver electrode in the solution;

3.4.4 Determination of the titration end point. Based on the titration record (3.4.3), USE the volume (V) and the potential value (E) of the silver nitrate standard titration solution in accordance with the example as shown in Table A.1, to calculate ΔE , ΔV , first derivative and second derivative in the listing method. OR otherwise USE the potentiometric titrator for automatic titration, and RECORD the volume and potential values of the silver nitrate standard

titration solution.

5.1.1 Powder, paste or liquid sample

TAKE at least 200 g of representative sample; MIX it uniformly; PLACE it in a sealed glass vessel.

5.1.2 Massive or granular solid sample

TAKE at least 200 g of representative sample; USE shredder to crush it or USE mortar to grind it fine; PLACE it in a sealed glass vessel.

5.2.1 Infant food and dairy products

WEIGH 10 g of uniformly mixed test specimen (accurate to 1 mg) and PLACE it into a 100 mL colorimetric tube with stopper; ADD 50 mL of hot water of about

70 °C; SHAKE to disperse the test specimen; BOIL it in water bath for 15 min

and SHAKE it from time to time; TAKE it out; MAKE it subjected to ultrasonic treatment for 20 min; COOL it to room temperature;

5.2.3 General vegetable products and pickled products

WEIGH about 10 g of test specimen (accurate to 1 mg) into a 100 mL colorimetric tube with stopper; ADD 50 mL of hot water of about 70 °C; SHAKE it for 5 min (OR use vortex oscillator to oscillate it for 5 min);

5.6 Fresh (frozen) meat, sausages, sauced meats, meats, barbecues and hams

5.3 Determination

PIPETTE 10.00 mL of test solution (5.2) (V2) into a 50 mL beaker; ADD 5 mL of nitric acid and 25 mL of acetone. IMMERSE the glass electrode and silver electrode into the solution; START the electromagnetic stirrer. USE the acid burette to drip V' mL of silver nitrate standard titration solution (90% of the required amount); MEASURE the potential value (E) of the solution.