



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

GB 5009.42-2016

**National food safety standard - Determination of Table Salt
Index**

食品安全国家标准 食盐指标的测定

(English Translation)

Issued on: August 31, 2016

Implemented on: March 1, 2017

Issued by: National Health and Family Planning Commission of the PRC

Table of Contents

Foreword...	3
1 Scope...	4
2 Determination of sodium chloride...	4
3 Determination of lead...	10
4 Determination of total arsenic...	13
5 Determination of cadmium...	13
6 Determination of total mercury...	13
7 Determination of barium...	13
8 Determination of potassium chloride...	14
9 Determination of potassium ferrocyanide (ferrous sulfate method)...	18
10 Determination of iodine (redox titration method)...	20

1 Scope

This Standard specifies the testing methods of sodium chloride, lead, total arsenic, cadmium, total mercury, barium, potassium chloride, potassium ferrocyanide, and iodine in table salt.

This Standard applies to the determination of table salt index.

2.1 Determination of water content

Operate according to the direct drying method in GB 5009.3. The drying temperature is set to $140\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$. DRY until the difference between the two masses before and after does not exceed 5 mg, that is, constant weight.

2.2.1 Principle

After the sample is dissolved, USE potassium chromate as an indicator; USE a silver nitrate standard titration solution to titrate, to determine the content of chloride ion.

2.2.2 Reagents and materials

Unless otherwise stated, the reagents used in this method are analytically pure; the water is the Grade 3 water specified in GB/T 6682.

2.2.2.1 Reagents

2.2.2.1.1

Silver nitrate.

2.2.2.1.2

Potassium chromate.

2.2.2.2 Preparation of reagents

2.2.2.2.1

Silver nitrate standard titration solution (0.1 mol/L).

liter (mol/L);

35.453 - The molar mass of chloride ion, in grams per mole (g/mol);

f - The dilution factor of the sample solution;

m - Sample mass, in grams (g);

100, 1000 - Unit conversion factor.

The calculation result is retained to two decimal places.

2.2.6 Precision

The absolute difference between the two independent determination results, obtained under repeated conditions, shall not exceed 5% of the arithmetic mean.

2.3 Determination of calcium

Operate according to the atomic absorption spectrophotometry in GB/T 5009.92.

2.4 Determination of magnesium

Operate according to GB/T 5009.90.

2.5.1 Principle

Excess barium chloride and the sulfate radical in the sample form insoluble barium sulfate precipitate. The remaining barium ions are titrated using a standard solution of disodium edetate (EDTA). USE indirect method to determine the sulfate radical.

2.5.2 Reagents and materials

Note: Unless otherwise stated, the reagents used in this method are analytically pure; the water is the Grade 3 water specified in GB/T 6682.

2.5.2.1 Reagents

2.5.2.1.1

Hydrochloric acid.

2.5.2.1.2

Aqueous ammonia.

2.5.2.1.3

Ammonium chloride.

2.5.2.1.4

Absolute ethanol.

2.5.4.1 Sample processing

WEIGH 25 g (accurate to 0.001 g) of the pulverized sample in a 400 mL beaker;

ADD about 200 mL of water; HEAT on a boiling water bath; USE a glass rod to stir until completely dissolved. After cooling, TRANSFER to a 500 mL volumetric flask; ADD water to the mark; SHAKE well; if necessary, filter. When the content of ions to be tested in the sample is too high, it may be appropriately diluted and then determined.

2.5.4.2 Determination

PIPETTE a sample solution (2.5.4.1) of a certain volume (so that the sulfate radical content in the solution is below 8 mg) in a 150 mL conical flask. ADD 1 drop of hydrochloric acid solution (2.5.2.2.1); ADD 5.00 mL of barium chloride solution (2.5.2.2.6); STIR for a while; LET it stand for 5 min. ADD 5 mL of ethylenediaminetetraacetic acid disodium magnesium solution, 10 mL of absolute ethanol, 5 mL of ammonia-ammonium chloride buffer solution, 4 drops of chrome black T indicator. USE EDTA standard titration solution to titrate, until the solution changes from wine red to brilliant blue. RECORD the volume V_3 of

EDTA standard titration solution consumed.

Titration of the total amount of calcium-magnesium in the solution. PIPETTE the sample solution of the same volume as the sulfate radical to be determined;

PLACE it in a 150 mL conical flask. ADD water to 25 mL. ADD 5 mL of ammonia-ammonium chloride buffer solution, 4 drops of chrome black T indicator. USE

EDTA standard titration solution to titrate, until the solution changes from wine red to brilliant blue. RECORD the volume V_2 of EDTA standard solution consumed.

2.5.5 Expression of analysis results

The content of sulfate radical in the sample is calculated according to formula (2).

Where.

X_2 - The content of sulfate radical in the sample, %;

V_1 - The amount of EDTA standard titration solution used when titrating the barium chloride solution, in milliliters (mL);

2.6.2.1 Sodium chloride (wet basis)

The content $X(w)$ of sodium chloride (wet basis) in the sample is the sodium chloride content calculated in accordance with 2.6.1, in %.

The calculation result is retained to two decimal places.

2.6.2.2 Sodium chloride (on a dry basis)

The sodium chloride content in the sample is calculated according to formula (3).

Where.

X_3 - The content of sodium chloride (on a dry basis) in the sample, %;

$X(w)$ - The content of sodium chloride (wet basis) in the sample, %;

P - Water content, %.

The calculation result is retained to two decimal places.

2.6.3 Precision

The absolute difference between the two independent determination results, obtained under repeated conditions, shall not exceed 10% of the arithmetic mean.

3.1 Principle

After the sample is treated, the lead ions, at a certain pH, form a complex with sodium diethyldithiocarbamate (DDTC). It is extracted and separated by 4- methyl-2-pentanone, introduced into an atomic absorption spectrometer. After electrothermal atomization, absorb the 283.3 nm resonance line. In a certain concentration range, the absorption value is directly proportional to the lead content, in comparative quantification with the standard series.