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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

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GB 5009.42-2025

Replacing GB/T 5009.42-2003

National food safety standard - Determination of the indices of edible salt

食品安全国家标准 食用盐指标的测定

Issued on: March 16, 2025 **Implemented on: September 16, 2025**

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Standardization Administration of the PRC

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Foreword

This document was issued on 16 March 2025 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 16 September 2025.

It is a GB standard without the /T suffix: compliance is mandatory in China.

The document runs to 35 pages in translation. The identification, the dates, the table of contents and the clauses reproduced on this page are taken from the standard itself.

GB 5009.42-2025 National food safety standard - Determination of edible salt parameters

It replaces GB/T 5009.42-2003, which is superseded.

1 Scope

GB 5009.42-2025 is the Chinese national food safety method for determining the indices of edible salt. Salt is the one food almost everyone in China eats every day from a regulated supply, and it is also the vehicle for the national iodine supplementation programme, which makes the iodine figure a public health measurement rather than a quality one: too little and the programme fails, too much and it harms. The standard covers the determination of the sodium chloride content, the iodine content, the moisture, the water-insoluble matter, the sulfate, the calcium and magnesium, the anti-caking agent and the contaminant elements, giving for each the principle, the reagents, the apparatus, the sample preparation, the

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procedure, the calculation, the precision and the limit of quantification. At 21,000 words it is a substantial method covering the whole specification of the product. The 2025 edition replaces the earlier GB/T method. For a salt producer, an importer or a food safety laboratory in China, this is the prescribed method.

This standard specifies the method for the determination of edible salt parameters.

This standard is applicable to the determination of edible salt parameters.

2 Sodium chloride

2.1 Moisture

2.1.1 Scope

The loss-on-drying method is applicable to the determination of moisture in refined salt, low sodium salt, and crushed and washed salt, while the ignition loss method is applicable to the determination of moisture in solar salt.

2.1.2 Loss-on-drying method

2.1.2.1 Principle

The specimen is dried at 140+/-2°C until constant weight is achieved, and its mass is weighted before and after drying. The moisture in edible salt is the sum of the loss on drying and the residual crystalline water in calcium sulfate, magnesium sulfate, calcium chloride, and magnesium chloride after drying.

2.1.2.2 Instruments and apparatus

2.1.2.2.1 Electronic balance: With a sensitivity of 0.0001 g.

2.1.2.2.2 Thermostatic drying oven.

2.1.2.2.3 Flat weighing bottle: 60 mm x 30 mm, dried to constant weight in a thermostatic drying oven at 140+/-2°C before use.

2.1.2.2.4 Desiccator: Containing effective desiccant.

2.1.2.3 Analytical steps

Weigh 10 g (to the nearest 0.0001 g) of a homogeneous specimen crushed to a size smaller than 2 mm in diameter and put it into a pre-weighed flat weighing bottle. Place the bottle in the thermostatic drying oven with the lid tilted against the bottle edge. Heat to 140+/-2°C and continue drying for 2 h. Cover the bottle, remove it from the oven, transfer it to a desiccator, cool to room temperature, and weigh. Subsequently, dry for 1 h each time and weigh (to the nearest 0.0001 g) until the difference between two consecutive weighing operations does not exceed 5 mg, indicating the realization of constant weight.

2.1.2.4 Expression of analysis results

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The moisture content in the specimen shall be calculated using Equation (1):

(1)

Where,

X1--the moisture content in the specimen, g/100 g;

m1--the total mass of the specimen and the weighing bottle before drying, g;

m2--the total mass of the specimen and the weighing bottle after drying, g;

m--the mass of the specimen weighed, g;

100--the unit conversion factor;

omega1--the calcium sulfate content in the specimen, g/100 g;

0.0662--the conversion factor for residual crystalline water in calcium sulfate in edible salt after drying at 140°C;

omega2--the magnesium sulfate content in the specimen, g/100 g;

0.1497--the conversion factor for residual crystalline water in magnesium sulfate in edible salt after drying at 140°C;

omega3--the calcium chloride content in the specimen, g/100 g;

0.3246--the conversion factor for residual crystalline water in calcium chloride in edible salt after drying at 140°C;

omega4--the magnesium chloride content in the specimen, g/100 g;

0.3784--the conversion factor for residual crystalline water in magnesium chloride in edible salt after drying at 140°C.

For moisture content >= 1.00 g/100 g, retain three significant figures; for moisture content < 1.00 g/100 g, retain two significant figures.

2.1.2.5 Precision

For moisture content < 1.00 g/100 g, the absolute difference between two independent determination results obtained under repeatability conditions shall not exceed 0.10 g/100 g; for moisture content between 1.00 g/100 g and 4.00 g/100 g, the absolute difference shall not exceed 0.20 g/100 g.

2.1.3 Ignition loss method

2.1.3.1 Principle

The specimen is ignited at 600°C, and its mass is weighted before and after ignition. The moisture content in edible salt is obtained by subtracting the mass loss of magnesium chloride from the ignition loss.

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2.1.3.2 Instruments and apparatus

2.1.3.2.1 Electronic balance: With a sensitivity of 0.0001 g.

2.1.3.2.2 High-temperature furnace.

2.1.3.2.3 Porcelain crucible: 60 mm x 60 mm (with an inner lid), ignited at 600°C in a high-temperature furnace for 1 h before use, then naturally cooled to below 200°C and removed. Place the porcelain crucible on a clean porcelain plate to cool for 5-6 min, transfer it into a desiccator, leave it cool to room temperature, and weigh.

2.1.3.2.4 Desiccator: Containing effective desiccant.

2.1.3.3 Analytical steps

Weigh 3 g (to the nearest 0.0001 g) of a homogeneous specimen crushed to a size smaller than 2 mm in diameter and put it into a pre-weighed porcelain crucible. Cover it with the inner and outer lids, and place the porcelain crucible in the high-temperature furnace, then heat to 600°C, and continue ignition for 1 h. After that, stop ignition, allow it to cool naturally to below 200°C, and remove. Place the porcelain crucible on a clean porcelain plate to cool for 5-6 min, transfer it into a desiccator, leave it cool to room temperature, and weigh (to the nearest 0.0001 g).

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