

**GB**

NATIONAL STANDARD OF THE  
PEOPLE'S REPUBLIC OF CHINA

**GB 5009.11-2024**

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**National food safety standard - Determination of total  
arsenic and inorganic arsenic in food**

食品安全国家标准 食品中总砷及无机砷的测定

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## Foreword

This Standard replaces GB 5009.11-2014 “National food safety standard - Determination of total arsenic and inorganic arsenic in food”.

Compared with GB 5009.11-2014, the main changes in this Standard are as follows:

### Part 1: Determination of total arsenic in food

- ADD the graphite furnace atomic absorption spectrometry as Method 3;
- DELETE the silver salt method for the determination of total arsenic in food;
- MODIFY the hydride generation atomic fluorescence spectrometry as Method 1, and MODIFY the sample digestion method;
- MODIFY the inductively coupled plasma mass spectrometry method as Method 2.

### Part 2: Determination of inorganic arsenic in food

- ADD the microwave-assisted extraction method for extracting inorganic arsenic from rice samples in Method 1 and Method 2;
- MODIFY the scope of application, detection limit, quantification limit, precision and expression of analysis results of Method 1 and Method 2;
- MODIFY the pretreatment method, extraction method and separation and determination conditions for the samples in Method 1 and Method 2.

# **National food safety standard - Determination of total arsenic and inorganic arsenic in food**

## **1 Scope**

Part 1 of this Standard specifies the methods for the determination of total arsenic in food.

Methods I and II of Part 1 of this Standard apply to the determination of total arsenic in food. Method 3 applies to the determination of total arsenic in food (except milk powder and prepared milk powder, oils and fats and their products, condiments, and special dietary foods).

Part 2 of this Standard specifies the methods for the determination of inorganic arsenic in food.

Part 2 of this Standard applies to the determination of inorganic arsenic in cereals and their products, aquatic animals and their products, edible fungi and their products, oils and fats and their products, condiments, supplementary foods for infants and young children, algae and their products.

## **Part 1: Determination of total arsenic in food**

### **Method 1 -- Hydride generation atomic fluorescence spectrometry**

## **2 Principle**

After the sample is digested, thiourea is added to pre-reduce the pentavalent arsenic to trivalent arsenic, and then sodium borohydride or potassium borohydride is added to reduce the trivalent arsenic to generate arsine, which is loaded into the quartz atomizer by argon gas and decomposed into atomic arsenic. The atomic arsenic produces atomic fluorescence under the excitation of the emitted light of the arsenic hollow cathode lamp. Under fixed conditions, its fluorescence intensity is proportional to the arsenic concentration in the solution being tested. It is quantitatively determined by external standard method.