



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

**中华人民共和国国家标准**

**GB/T 5009.138-2003**

**Replace GB / T 16343-1996, etc.**

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**Determination of Nickel in Foods**

**食品中镍的测定**

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## Foreword

This standard replaces GB/T 16343—1996 *Determination of Nickel in Foods and 4.9 Nickel* (applicable to margarine) in GB/T 5009. 37-1996 *Method for Analysis of Hygienic Standard of Edible Vegetable Oil* and Appendix B Nickel Test (Atomic Absorption Spectrophotometry) of *Hygienic Standard for Margarine*

This standard modifies the structure of the origin standard according to GB/T 20001.4-2001 *Standard Writing Rules Part 4: Chemical Analysis Method*.

This standard is put forward and centralized by Ministry of Health of the People's Republic of China.

The units responsible for the drafting of the first method in this Standard are: Zhejiang Academy of Medical Sciences, Institute of Food Hygiene Supervision and Inspection of Ministry of Health; Units participated in the drafting: Wuhan Municipal Health and Epidemic Prevention Station, Nanjing Railway Medical College, Beijing Municipal Health and Epidemic Prevention Station.

The units responsible for the drafting of the second method in this Standard are: Shanghai Municipal Health and Epidemic Prevention Station, Tianjin Municipal Health and Epidemic Prevention Station, Anhui Provincial Health and Epidemic Prevention Station, Shaanxi Provincial Health and Epidemic Prevention Station, Liaoning Provincial Health and Epidemic Prevention Station, Hunan Provincial Health and Epidemic Prevention Station, Institute of Food Hygiene Supervision and Inspection of Ministry of Health.

Main drafters of the first method in the Standard: Fu Yigen, Yang Huifen, Jiang Jianghong, Jiang Zhaokun, Mao Hong.

The issuance situations of the previous versions of the standard replaced by this standard are as follows:

——GB/T 16343-1996;

——GB / T 5009. 37-1985; GB / T 5009. 37-1996 part;

——GB 15196-1994 part.

## **Introduction**

Nickel is a kind of essential microelement for the body, but excessive intake will be harmful to the human health. China has developed the hygienic standards for the edible hydrogenated oil and margarine currently. The current standard methods are atomic absorption spectrophotometry and diacetyldioxime colorimetry, the sensitivity of which is low and cannot reach the current food hygiene standards. This standard specifies the determination method of nickel in foods with graphite furnace atomic absorption spectrophotometry. The sensitivity of this method is high and interference is less. In order to strengthen the supervision of food hygiene, it is necessary to formulate standard determination method for nickel.

# Determination of Nickel In Foods

## 1 Scope

The standard specifies the determination method of nickel in foods with graphite furnace atomic absorption spectrophotometry.

This standard is applicable to the determination of nickel in various foods.

### The First method Atomic absorption spectrophotometry

## 2 Principle

After digestion processing, the sample shall be introduced into the graphite furnace of atomic absorption spectrophotometer, and after electrothermal atomization, 232.0 nm resonance lines will be absorbed, its absorbance shall be proportional to the nickel content, and the quantification shall be done by comparison with the standard series.

Detection limit of this method is 1.4ng/m; linear range is 0ng/MI-100ng/mL.

## 3 Reagent

Unless otherwise indicated, it shall require the use of superior grade pure reagents.

### 3.1 Nitric acid

### 3.2 nitric acid

3.2 1+1 nitric acid: dilute 50mL nitric acid to 100mL with water.

3.3 0.5 mol/L **nitric acid** solution:

3.4 Hydrogen peroxide.

3.5 Nickel standard stock solution: 1.000 0 g nickel powder (99.99%) shall be accurately weighed, dissolved in 30 mL of nitric acid (1 + 1) and heated, then transferred into 1 000 mL volumetric flask and diluted with water to the scale. Per milliliter of this solution is equal to 1.0mg nickel .

3.6 Nickel standard working solution: When using, the nickel standard stock solution shall be progressively diluted with 0.5 mol / L nitric acid into equivalently 200 ng nickel per milliliter.

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