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

**中华人民共和国国家标准**

GB/T 5009.90-2003

Replace GB/T 12396-1990

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**Determination of iron, magnesium and manganese in foods**

**食品中铁、镁、锰的测定**

**Issued on August 11, 2003**

**Implemented on January 01, 2004**

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**Issued by Ministry of Health (MOH) of the People's Republic of China**

**Standardization Administration of the People's Republic of China  
(SAC)**

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## Foreword

This Standard will replace GB/T 12396-1990.

Comparison with GB/T 12396-1990, main changes of this Standard are as follows:

- Changed the Chinese title as *Determination of iron, magnesium and manganese in foods*;
- Changed the structure of original standard according to GB/T 20001.4-2001 *Rules for drafting standards—Part 4: Methods of chemical analysis*.

This Standard is proposed and under the jurisdiction of the Ministry of Health (MOH) of the People's Republic of China.

Chief draft unit of this standard: Nutrition and Food Hygiene Research Institute of Chinese Institute of Preventive Medicine.

Chief drafters of this standard: Zhou Xinghan, Men Jianhua and Wang Guangya.

This standard was issued for the first time in 1990, and revised now for the first time.

# Determination of iron, magnesium and manganese in foods

## 1 Scope

This standard specifies the determination of iron, magnesium and manganese in foods through atomic absorption spectrophotometric method.

This standard is applicable to the determination of the iron, magnesium and manganese in various foods.

The detection limit of this method: 0.2 $\mu$ g/mL for iron, 0.05 $\mu$ g/mL for magnesium and 0.1 $\mu$ g/mL for manganese.

## 2 Principle

After the test sample is wet digested, import it into the atomic absorption spectrophotometer; the resonance lines absorbed by iron, magnesium and manganese are 248.3nm, 285.2nm and 279.5nm respectively after flame atomization; the absorbing capacities are proportional to their contents, and compare the quantitation with the standard series.

## 3 Reagents

3.1 Hydrochloric acid.

3.2 Nitric acid.

3.3 Perchloric acid.

3.4 Digestive fluid of mixed acid: nitric acid + perchloric acid=4+1.

3.5 0.5mol/L nitric acid solution: measure 32mL of nitric acid, then add deionizer water and dilute it to 1000mL.

3.6 Standard solution

Iron, Magnesium and Manganese standard solution: Accurately weigh 1.0000 g of metallic iron, magnesium metal and manganese metal respectively (purity larger than 99.99%) or corresponding

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