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GB/T 5009.18-2003

Determination of Fluorine in Foods

食品中氟的测定

Ministry of Health of the People's Republic of China
Standardization Administration Committee of the People's Republic of China

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National Standard of the People's Republic of China

GB/T 5009.18-2003

In Replacement of GB/T 5009.18-1996

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Ministry of Health of the People's Republic of China

Standardization Administration Committee of the People's Republic of China

Foreword

This standard replaces GB/T 5009.18-1996 “Determination Method of Fluorine in Foods”.

Compared with GB/T 5009.18-1996, major changes of this standard are as follows:

—the Chinese name of the standard has been modified to “Determination of Fluorine in Foods”.

—the structure of the original standard has been revised according to GB/T 20001.4-2001 “Rules for Drafting Standards - Part 4: Methods of Chemical Analysis”.

This standard was proposed by and is under the jurisdiction of Ministry of Health of the People’s Republic of China.

Method I and Method III in this standard were drafted by Institute for Nutrition and Food Hygiene of Chinese Academy of Preventive Medicine and Food Hygiene Supervision and Inspection Institute of the Ministry of Health.

Method II in this standard was drafted by Sichuang Mianyang Health and Epidemic Prevention Station.

The original standard was first published in 1985; the first revision was made in 1996 and this edition is the second revision.

Determination of Fluorine in Foods

1 Scope

This standard specifies the determination method of fluorine in grains, vegetables, fruits, beans and their products, meat, fish, eggs, *etc*.

This standard applies to the determination of fluorine in foods. The fluorine ion selective electrode method is not applicable to the test sample with high fat content and without ashing treatment, such as peanuts and fatty meat, *etc*.

The limit of detection for this method: 0.10 mg/kg for method I; 1.25 mg/kg for method II.

Method I Diffusion-Fluorine Reagent Colorimetric Method

2 Principle

The fluoride in foods reacts with acid in diffusion chamber and generates hydrogen fluoride gas; after diffusion, it is absorbed by sodium hydroxide. At appropriate pH, the fluorine ion reacts with lanthanum (III) and fluorine reagent (alizarin complexone), and generates blue ternary complex; this color will get darker with the increase of concentration of fluorine ions. Perform the extraction with or without using organic solvent containing amine, and make quantitative analysis compared with standard series.

3 Reagents

All the water used in this method is fluorine-free deionized water; all reagents are the analytical pure reagents and shall be stored in polyethylene plastic bottle.

3.1 Acetone.

3.2 Silver sulfate-sulfuric acid solution (20 g/L): weigh 2g of silver sulfate and dissolve in 100mL of sulfuric acid (3+1).

3.3 Sodium hydroxide-anhydrous ethanol solution (40 g/L): take 4g of sodium hydroxide, dissolve in anhydrous ethanol, and dilute to 100 mL.

3.4 Acetic acid solution (1 mol/L): take 3 mL of glacial acetic acid, add water and dilute to 50 mL.

3.5 Alizarin complexone solution: weigh 0.19 g of alizarin complexone, and then add a small amount of water and sodium hydroxide solution (40 g/L) to dissolve; add 0.125 g of sodium

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