



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

GB 5009.28-2016

**National food safety standard - Determination of Benzoic Acid,
Sorbic Acid and Saccharin Sodium in Foods**

食品安全国家标准 食品中苯甲酸、山梨酸和糖精钠的测定

(English Translation)

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Foreword

This Standard replaces GB/T 5009.29-2003 "Determination of sorbic acid and benzoic acid in foods", GB/T 5009.28-2003 "Determination of saccharin sodium in foods", GB/T 23495-2009 "Determination of benzoic acid, sorbic acid and saccharin sodium in foods - High performance liquid chromatography method", GB 21703-2010 "National food safety standard - Determination of benzoic acid and sorbic acid in milk and milk products", SN/T 2012-2007 "Determination of benzoic acid and sorbic acid in vinegar for export and import-Liquid chromatography" AND SB/T 10389-2004 "Determination of sorbic acid in meat and meat products".

Compared with GB/T 5009.29-2003, main changes are as follows.

- The standard name was changed to "National Food Safety Standard - Determination of benzoic acid, sorbic acid and saccharin sodium in foods";

- Add "multi-point calibration" method to prepare the standard curve;
- Modify the pre-processing method for sample;
- Delete contents of packed-column's chromatography-column separation in gas chromatography;
- Add contents of capillary's chromatography-column separation in gas chromatography.

National Food Safety Standard - Determination of Benzoic Acid, Sorbic Acid and Saccharin Sodium in Foods

1 Scope

This Standard specifies the determination method for benzoic acid, sorbic acid AND sodium saccharin in foods.

The first method of this Standard is applicable to the determination of benzoic acid, sorbic acid AND saccharin sodium in foods; the second method is applicable to the determination of benzoic acid and sorbic acid in soy sauce, fruit juice AND jam.

First method - Liquid chromatography

2 Principle

Use water to extract the sample; use n-hexane to degrease high-fat sample; use protein precipitation agent to precipitate the protein of high-protein sample; adopt liquid chromatography to perform separation; use UV detector to perform detection; use external standard method to determine the quantity.

3 Reagents and Materials

Unless otherwise stated, the used reagents in this method shall all be analytical purity; the water shall be the Grade-1 water which is specified in GB/T 6682.

3.2.1 Ammonia solution (1+99). take 1mL of ammonia; add it into 99mL water; mix it evenly.

3.2.2 Potassium ferrocyanide solution (92g/L). weigh and take 106g of potassium ferrocyanide; add appropriate amount of water to dissolve it; use water to dilute it to 1000mL.

3.2.5 Formic acid-ammonium acetate solution (2mmol/L formic acid + 20 mmol/L ammonium acetate). weigh and take 1.54 g of ammonium acetate; add appropriate amount of water to dissolve it; add 75.2μL of formic acid; use water to dilute it to 1000mL. After it is filtered by 0.22μm aqueous microfiltration membrane, it shall be set for standby application.

3.3.1 Sodium benzoate (C₆H₅COONa, CAS No.. 532-32-1). The purity shall be $\geq$ 99.0%; OR benzoic acid (C₆H₅COOH, CAS No.. 65-85-0). The purity shall be $\geq$ 99.0%; OR the standard substance which is certified by the country AND granted for standard substance certificate.

3.4.1 Benzoic acid, sorbic acid AND saccharin sodium (calculated as saccharine) standard stock solution (1000mg/L).

3.4.2 Mixed standard intermediate solution (200mg/L) of benzoic acid, sorbic acid AND

saccharin sodium (calculated as saccharin). respectively and accurately pipette 10.0mL of the mixed standard stock solution of benzoic acid, sorbic acid AND saccharin sodium into a 50mL volumetric flask; use water to set the constant volume. At 4°C, store it. The preservation period shall be 3 months.

5.1 Preparation of sample

Take a plurality of prepackaged homogeneous samples, such as beverages and liquid milk, etc.; mix them directly;

5.2.1 General Samples

Accurately weigh and take about 2g (accurate to 0.001g) of sample in a 50mL stoppered centrifuge tube; add about 25mL of water; vortex-mix it; in 50°C water bath,

sonicate it for 20min;

5.2.2 Samples of gum-base jelly and candy, etc.

Accurately weigh and take about 2g (accurate to 0.001g) of sample in a 50mL stoppered centrifuge tube; add about 25mL of water; vortex-mix it; in 70°C water bath, heat and dissolve the sample; in 50°C water bath, sonicate it for 20min. Subsequent operations shall be the same as those in 5.2.1.

5.3.1 Chromatographic column. C18 column; column length - 250mm; inner diameter

- 4.6mm; particle size - 5µm; OR the chromatographic column with equivalent performance.

5.5 Determination of sample solution

Inject the sample solution into the liquid chromatograph; obtain the peak area; according to the standard curve, obtain the mass concentration of benzoic acid, sorbic acid AND saccharin sodium (calculated as saccharine) in test solution.

6 Expression of Analysis Results

Content of benzoic acid, sorbic acid AND saccharin sodium (calculated as saccharin) in sample shall be calculated according to formula (1).

7 Precision

The absolute difference between the two independent determinations results which are obtained under repeatability conditions shall not exceed 10% of the arithmetic mean.

8 Others

When the sample volume is 2g AND the constant volume is 50 mL, the detection limit of benzoic acid, sorbic acid and saccharin sodium (calculated as saccharine) shall all be 0.005g/kg; the limit of quantitation shall all be 0.01g/kg.