



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

GB 23200.123-2026

**National food safety standard-Determination of sulfonyl fluoride
residue in foods of plant origin-Gas chromatography method**

食品安全国家标准 植物源性食品中磺酰氟残留量的测定 气相色谱法

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Foreword

This document was issued on 12 February 2026 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 March 2026.

It is a GB standard without the /T suffix: compliance is mandatory in China.

The document runs to 15 pages in translation. The identification, the dates, the table of contents and the clauses reproduced on this page are taken from the standard itself.

National Food Safety Standard - Determination of sulfuryl fluoride residues in plant-derived foods - Gas chromatography method

1 Scope

GB 23200.123 is the Chinese national food safety method for sulfuryl fluoride residues in plant-derived foods, by gas chromatography. Sulfuryl fluoride is a fumigant used on stored grain, dried fruit and timber, and because it is a gas the residue question is not the usual one: what has to be measured is what remains dissolved in the commodity after the fumigation has ended and the store has been ventilated. The method answers that with a headspace technique: the sample is extracted with water, the sulfuryl fluoride volatilises from the headspace vial under heating, is carried onto the column and detected with an

electron capture detector, and quantified against an external standard. The document carries the reagents and the preparation of the standard solutions, the apparatus, the sample preparation, the analytical procedure, the calculation, the precision, the limit of quantification and reference chromatograms. It is a companion to GB 2763, which sets the limits this method checks.

This document specifies the gas chromatography method for the determination of sulfuryl fluoride residues in plant-derived foods.

This document applies to the determination of sulfuryl fluoride residues in plant-derived foods.

2 Normative references

The contents of the following documents constitute essential provisions of this document through normative reference. For dated references, only the edition cited applies. For undated references, the latest edition (including all amendments) applies.

GB 2763-2026 National Food Safety Standard - Maximum residue limits for pesticides in food

GB/T 6682 Water for analytical laboratory use - Specification and test methods

3 Principle

After the test sample is extracted with water, the target sulfuryl fluoride molecules volatilise from the headspace vial under heating conditions, enter the gas chromatography column with the aid of the carrier gas for separation, and are detected using a gas chromatograph equipped with a headspace sampler and an electron capture detector (ECD). Quantification is performed by the external standard method.

4 Reagents and materials

Unless otherwise stated, only chromatographically pure reagents and Grade 1 water complying with GB/T 6682 shall be used in the analysis.

4.1 Reagents

4.1.1 Acetone (CH_3COCH_3 , CAS No.: 67-64-1).

4.1.2 Ammonium chloride (NH_4Cl , CAS No.: 12125-02-9).

4.2 Standard

Sulfuryl fluoride (SO_2F_2 , CAS No.: 2699-79-8); purity $\geq 99.0\%$ (store in an aluminium foil gas sampling bag). Information on the sulfuryl fluoride reference material is given in Table A.1 of Annex A.

4.3 Preparation of standard solutions

SAFETY WARNING - The acetone cryogenic solution shall be prepared in an explosion-proof refrigerator.

4.3.1 Sulfuryl fluoride standard stock solution: Take a 100 mL headspace vial containing approximately 90 mL of cold acetone (acetone pre-cooled in a refrigerator at -18 °C or below), add a stopper, and weigh. Slowly inject sulfuryl fluoride from the aluminium foil gas sampling bag into the acetone through the gas inlet/outlet valve on the sampling bag (or inject approximately 48 mL of sulfuryl fluoride into the acetone using a syringe). The injection time shall be approximately 2 min. Immediately cover the vial with a stopper and weigh on an analytical balance (accurate to 0.1 mg). The difference between the two weighings is the mass of sulfuryl fluoride in the solution. Then accurately add 10 mL of cold acetone (acetone pre-cooled in a refrigerator at -18 °C or below) to prepare a sulfuryl fluoride standard stock solution with a concentration of approximately 2 000 mg/L. Store in a low-temperature refrigerator at -18 °C or below in the dark. The validity period is 1 month.

4.3.2 Sulfuryl fluoride standard intermediate solution (approximately 20 mg/L): Accurately pipette 1.0 mL of the sulfuryl fluoride standard stock solution into a 100 mL headspace vial (pre-filled with 90 mL of acetone pre-cooled in a refrigerator at -18 °C or below). Accurately add 9 mL of cold acetone (acetone pre-cooled in a refrigerator at -18 °C or below) to prepare a sulfuryl fluoride standard intermediate solution with a mass concentration of approximately 20 mg/L. Prepare immediately before use.

4.3.3 Sulfuryl fluoride standard working solution (approximately 1 mg/L): Accurately pipette 5.0 mL of the sulfuryl fluoride standard intermediate solution into a 100 mL headspace vial (pre-filled with 90 mL of acetone pre-cooled in a refrigerator at -18 °C or below). Accurately add 5 mL of cold acetone (acetone pre-cooled in a refrigerator at -18 °C or below) to prepare a sulfuryl fluoride standard working solution with a mass concentration of approximately 1 mg/L. Prepare immediately before use.