

Translated English of Chinese Standard: GB25576-2020

www.ChineseStandard.net → Buy True-PDF → Auto-delivery.

Sales@ChineseStandard.net

GB

NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

GB 25576-2020

**National food safety standard - Food additive - Silicon
dioxide**

食品安全国家标准 食品添加剂 二氧化硅

Issued on: September 11, 2020

Implemented on: March 11, 2021

**Issued by: National Health Commission of the People's Republic of
China;
State Administration for Market Regulation.**

Table of Contents

Foreword.....	3
1 Scope.....	4
2 Molecular formula and relative molecular mass.....	4
3 Technical requirements	4
Appendix A Inspection method.....	6

Foreword

This Standard replaces GB 25576-2010, "Food Additives - Silicon dioxide".

Compared with GB 25576-2010, the major changes of this Standard are as follows:

- Modify the indicator of loss on drying for Type-III products to not more than 7.0%;
- Modify the drying time for the inspection method of loss on drying;
- Modify the ignition time for the inspection method of loss on ignition;
- Modify the reference method of lead content determination;
- Modify the reference method of arsenic content determination.

National food safety standard - Food additive - Silicon dioxide

1 Scope

This Standard applies to fumed silica that is produced by the gas phase method (chlorosilane is hydrolyzed in the oxygen-hydrogen flame), silica gel and hydrated silica gel that are produced by the gel method (reaction of sodium silicate solution and acid), and precipitated silicon dioxide that is produced by the precipitation method (reaction of sodium silicate solution and acid).

2 Molecular formula and relative molecular mass

2.1 Molecular formula

SiO₂

2.2 Relative molecular mass

60.08 (according to the international relative atomic mass in 2016)

3 Technical requirements

3.1 Sensory requirements

Sensory requirements shall be in accordance with Table 1.

Table 1 -- Sensory requirements

3.2 Physical and chemical indicators

Physical and chemical indicators shall be in accordance with Table 2.

Appendix A

Inspection method

A.1 Warning

Some reagents that are used in the test method of this Standard are toxic or corrosive. The operator must be cautious! If splashed on the skin, use water to rinse immediately. In severe cases, treat immediately.

A.2 General provisions

The reagents and water that are used in this Standard, when no other requirements are specified, refer to analytical reagents and grade-III water which is specified in GB/T 6682. The impurity standard solutions, preparations and products, which are used in the test, shall be prepared according to the provisions of GB/T 602 and GB/T 603 when no other requirements are specified. The used solution, if not indicated which solvent is used, refers to aqueous solution.

A.3 Identification test

A.3.1 Reagents and materials

A.3.1.1 Anhydrous potassium carbonate.

A.3.1.2 Ammonia.

A.3.1.3 Nitric acid.

A.3.1.4 Disodium hydrogen phosphate solution: Dissolve 12 g of disodium hydrogen phosphate ($\text{Na}_2\text{HPO}_4 \cdot 7\text{H}_2\text{O}$); add water to 100 mL.

A.3.1.5 Ammonium molybdate solution: Dissolve 6.5 g of molybdic acid powder in a mixture of 14 mL of water and 14.5 mL of ammonia; cool it; slowly add it to the pre-cooled mixture of 32 mL of nitric acid and 40 mL of water under stirring; leave it for 48 h. Perform suction filtration; store the filtrate in a dark place. This solution will deteriorate and become invalid when it is left for a long time. When 2 mL of disodium hydrogen phosphate solution is added to 5 mL of the above solution, and the solution does not immediately produce a large amount of yellow precipitate, the solution becomes invalid.

A.3.1.6 O-tolidine glacial acetic acid saturated solution.

A.3.2 Identification method

A.3.2.1 Weigh about 5 mg of the sample in a platinum crucible; add 200 mg of anhydrous potassium carbonate to mix; burn for about 10 minutes at 500 °C ~

Where:

m_1 -- mass of the sample and the platinum crucible, in grams (g);

m_2 -- mass of the hydrofluoric acid residue after treatment and the platinum crucible, in grams (g);

m_0 -- mass of the platinum crucible, in grams (g);

The test result is based on the arithmetic mean of the parallel determination results. The absolute difference between two independent determination results that are obtained under repeatability conditions is not more than 0.3%.

A.5 Determination of loss on drying

A.5.1 Instruments and apparatuses

A.5.1.1 Electrothermal constant-temperature drying oven: Control the temperature at $105\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$.

A.5.1.2 Weighing bottle: $\phi 60\text{ mm} \times 30\text{ mm}$.

A.5.2 Analysis steps

Use a weighing bottle that is dried at $105\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ to weigh 2 g ~ 3 g of the sample (for Type-II, weigh 8 g ~ 10 g), accurate to 0.000 2 g. Transfer it into the electrothermal constant-temperature drying oven; dry at $105\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ for 120 min $\pm$ 5 min; cool in a desiccator; weigh. Keep this dried sample as sample A, for use in the determination of loss on ignition in A.6.

A.5.3 Result calculation

Calculate the mass fraction w_2 of loss on drying according to Formula (A.2):

$$w_2 = \frac{m_4 - m_5}{m_4 - m_3} \times 100\% \quad \dots\dots\dots (\text{A.2})$$

Where:

m_4 -- mass of the sample and weighing bottle before drying, in grams (g);

m_5 -- mass of the sample and weighing bottle after drying, in grams (g);

m_3 -- mass of the weighing bottle, in grams (g).

The test result is based on the arithmetic mean of the parallel determination results. The absolute difference between two independent determination results that are obtained under repeatability conditions is not more than 0.2%.

Weigh $5.00\text{ g} \pm 0.01\text{ g}$ of the sample that has been dried at $105\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ for 2 h; put it in a 250 mL flask that is equipped with a cooling reflux device; add 50 mL of hydrochloric acid solution; slowly heat it to boiling on the electric furnace; boil slightly for 15 min; then, cool it. Let the insoluble matter precipitate; use a glass sand funnel to perform suction filtration; transfer the filtrate into a 100 mL volumetric flask; use hot water to wash the insoluble matter 3 times; use 10 mL of water each time. Transfer the filtrate to a volumetric flask; finally, use 15 mL of hot water to wash the funnel and the suction flask; cool the filtrate to room temperature; use water to dilute to the mark; shake well. This solution is sample solution A, which is used for the determination of lead, heavy metals, and arsenic.

Do a blank test at the same time.

A.7.2.2 Determination

Use sample solution A (see A.7.2.1) and the corresponding blank solution, as the sample solution after digestion; perform the determination in accordance with the method that is specified in GB 5009.12. The water that is used in the test is grade-II water that meets the requirements of GB/T 6682.

The test result is based on the arithmetic mean of the parallel determination results. The absolute difference between two independent determination results that are obtained under repeatability conditions is not more than 1 mg/kg.

A.8 Determination of heavy metals (in Pb)

Accurately pipette 20 mL of sample solution A (see A.7.2.1) and 3 mL of lead standard use solution ($10\text{ }\mu\text{g/mL}$); perform the determination according to Chapter 6 in GB 5009.74-2014. The water that is used in the test is grade-II water that meets the requirements of GB/T 6682.

A.9 Determination of arsenic (As)

Use sample solution A (see A.7.2.1) and the corresponding blank solution, as the sample solution after digestion; perform the determination in accordance with the method that is specified in GB 5009.76. The water that is used in the test is grade-II water that meets the requirements of GB/T 6682.

The test result is based on the arithmetic mean of the parallel determination results. The absolute difference between two independent determination results that are obtained under repeatability conditions is not more than 0.6 mg/kg.

A.10 Determination of soluble dissociated salt (in Na_2SO_4)

A.10.1 Reagents and materials

This is an excerpt of the PDF (Some pages are marked off intentionally)

Full-copy PDF can be purchased from 1 of 2 websites:

1. <https://www.ChineseStandard.us>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Select your country (currency), for example: USA (USD); Germany (Euro).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Tax invoice can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with download links).

2. <https://www.ChineseStandard.net>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Add to cart. Only accept USD (other currencies - <https://www.ChineseStandard.us>).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with PDFs attached, invoice and download links).

Translated by: Field Test Asia Pte. Ltd. (Incorporated & taxed in Singapore. Tax ID: 201302277C)

About Us (Goodwill, Policies, Fair Trading...): <https://www.chinesestandard.net/AboutUs.aspx>

Contact: Wayne Zheng, Sales@ChineseStandard.net

Linkin: <https://www.linkedin.com/in/waynezhengwenrui/>

----- The End -----