

Translated English of Chinese Standard: YST273.5-2006

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

Sales@ChineseStandard.net

YS

NONFERROUS METAL INDUSTRY STANDARD
OF THE PEOPLE'S REPUBLIC OF CHINA

ICS 71.100.10

H 21

YS/T 273.5-2006

Replacing YS/T 273.5-1994

**Chemical analysis methods and physical properties of
cryolite - Part 5: Determination of sodium by flame atomic
absorption spectrometric method**

冰晶石化学分析方法和物理性能测定方法

第 5 部分：火焰原子吸收光谱法测定钠含量

Issued on: May 25, 2006

Implemented on: December 1, 2006

Issued by: National Development and Reform Commission of PRC

Table of Contents

Foreword	3
1 Scope	5
2 Method summary	5
3 Reagents	5
4 Apparatus	5
5 Sample	6
6 Analysis procedure	6
7 Calculation of analysis results	7
8 Precision	8
9 Quality assurance and control	8

Foreword

YS/T 273 "Chemical analysis methods and physical properties of cryolite" is divided into 13 parts:

- Part 1: Determination of moisture content - Gravimetric method;
- Part 2: Determination of ignition loss;
- Part 3: Determination of fluoride content;
- Part 4: Determination of aluminum content - EDTA titration method;
- Part 5: Determination of sodium by flame atomic absorption spectrometric method;
- Part 6: Determination of silica content by the molybdenum blue photometric;
- Part 7: Determination of iron content by orthophenanthroline photometric method;
- Part 8: Determination of sulfate content - Barium sulfate gravimetric method;
- Part 9: Determination of phosphorus pentoxide content - Molybdenum blue photometric method;
- Part 10: Determination of alumina content by gravimetric method;
- Part 11: Determination of sulphur content by X-ray fluorescence spectrometric method;
- Part 12: The atomic absorption spectrophotometric method for the determination of calcium oxide content;
- Part 13: Preparation and storage of test samples.

This Part is Part 5.

This part is a revision of YS/T 273.5-1994. In addition to editorial modification, two chapters on Precision AND Quality Assurance and Control have been added. Other changes include:

- The measuring wavelength of the instrument is changed from the most sensitive 589.0 nm to the hypo-sensitive 589.6 nm;
- The length of the working curve is shortened, and the concentration of the highest concentration standard solution in the working curve is reduced from 10.0 µg/mL to 5.00 µg/mL;

Chemical analysis methods and physical properties of cryolite - Part 5: Determination of sodium by flame atomic absorption spectrometric method

1 Scope

This Part specifies the method for the determination of sodium content in cryolite.

This Part applies to the determination of sodium content in cryolite. Determination range: 20%~35%.

2 Method summary

After the test portion is dissolved with sulfuric acid, it is heated to remove fluorine, and the precipitate is dissolved with hydrochloric acid and water; the sodium content of the test solution is determined at the wavelength of 589.0 nm or 589.6 nm of an atomic absorption spectrometer by the use of an air-acetylene fuel-lean flame.

3 Reagents

3.1 Sulfuric acid (ρ 1.84 g/mL).

3.2 Hydrochloric acid (ρ 1.19 g/mL).

3.3 Sodium standard solution: Weigh 3.089 g of anhydrous sodium sulfate that has been dried at 120 °C and cooled in a desiccator, place it in a 250 mL beaker, and add 100 mL of water to dissolve; then, add 10 mL of hydrochloric acid (3.2), transfer the solution to a 1000 mL volumetric flask, dilute to volume with water, mix well, and transfer it to a polyethylene bottle. 1 mL of this solution contains 1.000 mg of sodium.

4 Apparatus

4.1 Platinum dish: The diameter is 80 mm, and the height is 35 mm.

4.2 Atomic absorption spectrometer: It is equipped with a sodium hollow cathode lamp.

Any instrument that can meet the following indicators under the best working conditions can be used.

- Characteristic concentration: In a solution consistent with the matrix of the measured sample, the characteristic concentration of sodium shall not be greater than 0.07 ug/mL.
- Precision: Use the standard solution with the highest concentration to measure the absorbance 10 times, and the standard deviation shall not exceed 1.0% of the average absorbance; use the standard solution with the lowest concentration (not the "zero" concentration standard solution) to measure the absorbance 10 times, and the standard deviation shall not exceed 0.5% of the average absorbance of the highest concentration standard solution.
- Working curve linearity: Divide the working curve into 5 equal segments according to concentration, and the ratio of the absorbance difference in the highest segment to the absorbance difference in the lowest segment is not less than 0.85.

5 Sample

The sample shall comply with the requirements of 3.3 in YS/T 273.13.

6 Analysis procedure

6.1 Test portion

Weigh 0.5 g of test sample (5), accurate to 0.0001 g.

6.2 Number of determinations

Two determinations shall be carried out independently and the average value shall be taken.

6.3 Blank test

Do a blank test along with the sample test.

6.4 Determination

6.4.1 Place the test portion (6.1) in the platinum dish (4.1), add 5 mL of sulfuric acid (3.1), and slowly dissolve it in a sand bath (15 min~20 min) to remove fluorine; then, heat it to evaporate until the thick smoke emits; remove the test portion and cool it to room temperature; add 3 mL of hydrochloric acid (3.2) and 30 mL of water, and heat in a low-temperature sand bath until all salts are dissolved. After cooling, transfer the solution to a 500 mL volumetric flask, dilute to volume with water, and mix well.

6.4.2 According to Table 1, take the test solution (6.4.1), place it in a 500 mL volumetric

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 -----