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**NONFERROUS METALS INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

YS/T 509.8-2008

Methods for chemical analysis of spodumene and lepidolite concentrates. Determination of calcium oxide and magnesium oxide content. Flame atomic absorption spectrometric method
(English Translation)

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Foreword

YS/T 509 Methods for Chemical Analysis of Spodumene and Lepidolite Concentrates

is divided into 11 parts:

---Part 1: Determination of Lithium Oxide Sodium Oxide and Potassium Oxide

Contents - Flame Atomic Absorption Spectrometric Method;

---Part 2: Determination of Rubidium Oxide and Caesium Oxide Contents - Flame

Atomic Absorption Spectrometric Method;

---Part 3: Determination of Silicon Dioxide Content - Gravimetric - Molybdenum

Blue Photometric Method;

---Part 4: Determination of Aluminum Oxide Content - EDTA Compleximetric

Method;

---Part 5: Determination of Ferric Oxide Content - O-phenanthroline Photometric

Method and EDTA Compleximetric Method;

---Part 6: Determination of Phosphorus Pentoxide Content - The Molybdenum

Blue Photometric Method;

---Part 7: Determination of Beryllium Oxide Content - Chromazurol S and

Cetyltrimethyl Ammonium Bromide Spectrophotometric Method;

---Part 8: Determination of Calcium Oxide and Magnesium Oxide Content - Flame Atomic Absorption Spectrometric Method;

---Part 9: Determination of Calcium Oxide and Magnesium Oxide Content - Flame Atomic Absorption Spectrometric Method;

---Part 10: Determination of Manganous Oxide Content - Persulfate Oxidation Photometric Method;

---Part 11: Determination of Loss on Ignition - Gravimetric Method.

This Part is Part 8.

This Part serves as a replacement of YS/T 509.9-2006 Methods for Chemical Analysis of Spodumene and Lepidolite Concentrates - The Atomic Absorption Spectrophotometric Method for the Determination of Calcium Oxide and Magnesium Oxide Contents (the former GB/T 3885.9-1983).

In comparison with YS/T 509.9-2006, this Part mainly has the following changes:

---The text formatting is re-edited;

Methods for Chemical Analysis of Spodumene and
Lepidolite Concentrates - Determination of Calcium
Oxide and Magnesium Oxide Content - Flame Atomic
Absorption Spectrometric Method

1 Scope

This Part specifies the method of determining calcium oxide and magnesium oxide content in spodumene and lepidolite concentrates.

This Part is applicable to the determination of calcium oxide and magnesium oxide content in spodumene and lepidolite concentrates. The range of determination is 0.10% ~ 3.00%.

2 Method Summary

Use hydrofluoric acid, perchloric acid and hydrochloric acid to decompose the sample.

In the hydrochloric acid medium, add lanthanum and strontium release agents. At wavelengths of 422.7 nm and 285.2 nm of the atomic absorption spectrometer, use the

air - acetylene (or nitrous oxide - acetylene) enriched flame for the respective determination of calcium oxide and magnesium oxide.

3 Reagents

Unless it is otherwise specified, only reagents that are confirmed to be analytically pure, and distilled water or water of equivalent purity are used in the analysis.

3.4 Lanthanum solution: weigh-take 40.11 g of lanthanum chloride ($\text{LaCl}_3 \cdot 7\text{H}_2\text{O}$);

place it in a 250 mL beaker; use water to dissolve it. When the solution is turbid, add a few drops of hydrochloric acid (3.3), or heat it up to make it clear. Transfer the solution into a 500 mL volumetric flask; use water to dilute it to the scale; mix it well. 1 mL of this solution contains 30 mg of lanthanum.

3.5 Strontium solution: weigh-take 15.2 g of strontium chloride ($\text{SrCl}_2 \cdot 6\text{H}_2\text{O}$); place it

---Linear working curve: in accordance with the concentration, divide the working curve into five equal sections. The ratio of the absorbance difference of the highest section to the absorbance difference of the lowest section shall be not less than 0.7.

5.1 Spodumene concentrates shall pass through a sieve with a mesh of 0.074 mm;

lepidolite concentrates shall pass through a sieve with a mesh of 0.105 mm.

5.2 Bake the test piece at 105 °C ~ 110 °C for 2 h in advance, then, place it in a desiccator to cool down to room temperature.

6.1 Sample

Weigh-take 0.10 g of the sample, accurate to 0.0001 g.

6.2 Number of Determinations

Conduct parallel determination of two samples; take the average value.

6.3 Blank Test

Conduct a blank test on the accompanying sample.

6.4.1 Place the sample (6.1) in a 50 mL platinum dish; use a small amount of water to

moisten it. Add 2 mL of perchloric acid (3.1), 2 mL of hydrochloric acid (3.3) and 10 mL of hydrofluoric acid (3.2). Place it on a sand bath; heat it up to decompose it. Steam it, until it emits thick white smoke of perchloric acid. Then, remove it and cool it down.

6.4.2 Use water to rinse the wall of the dish. Place it on a sand bath; continue to heat

it up, until the white smoke of perchloric acid is exhausted, then, remove it and cool it down.

6.4.3 Add 2.0 mL of hydrochloric acid (3.3) and about 20 mL of water; place it on a

sand bath; heat it up to completely dissolve the salts. Then, remove it and cool it down to room temperature.

6.4.4 Transfer the solution into a 100 mL volumetric flask. Add 5.0 mL of lanthanum

solution (3.4) and 5.0 mL of strontium solution (3.5); use water to dilute to the scale; mix it well.

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