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

YS/T 509.7-2008

**Methods for chemical analysis of spodumene and lepidolite
concentrates. Determination of beryllium oxide content. Chromazurol S
and cetyltrimethyl ammonium bromide spectrophotometric 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 7.

This Part serves as a replacement of YS/T 509.8-2006 Methods for Chemical Analysis of Spodumene and Lepidolite Concentrates - The Chromazurol S and Cetyltrimethyl Ammonium Bromide Photometric Method for the Determination of Beryllium Oxide Content (the former GB/T 3885.8-1983).

In comparison with YS/T 509.8-2006, this Part mainly has the following changes:

---The text formatting is re-edited;

Methods for Chemical Analysis of Spodumene and
Lepidolite Concentrates - Determination of Beryllium
Oxide Content - Chromazurol S and Cetyltrimethyl
Ammonium Bromide Spectrophotometric Method

1 Scope

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

This Part is applicable to the determination of beryllium oxide content in spodumene and lepidolite concentrates. The range of determination is 0.01% ~ 1.00%.

2 Method Summary

Use hydrofluoric acid to decompose the sample and drive off silicon; use alkali to melt it; use water to leach it. Beryllium is separated from elements like iron and manganese in the state of sodium beryllate. Transfer-take part of the clear solution; adjust pH to

11 Beryllium forms a red ternary complex with Chromazurol S and CTMAB. At a

wavelength of 520 nm of the spectrophotometer, measure its absorbance. Use tartaric acid, sodium citrate, EDTA and triethanolamine to jointly mask the interfering ions.

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.

6.4.7 Add 2.0 mL of Chromazurol S solution (3.11) and 2.0 mL of CTMAB anhydrous

ethanol solution (3.12). Use water to dilute to the scale; mix it well. Let it stand for 45 min.

6.4.8 Transfer part of the solution (6.4.7) into a 1 cm cuvette; take the blank solution of

the accompanying sample as a reference. At a wavelength of 520 nm of the spectrophotometer, measure its absorbance. Through the working curve, find out the corresponding beryllium oxide content.

6.5.1 Transfer-take 0 mL, 0.50 mL, 1.00 mL, 1.50 mL, 2.00 mL and 2.50 mL of beryllium

oxide standard solution (3.14). Respectively place them in a group of 50 mL beakers. Proceed in accordance with the steps in 6.4.5 ~ 6.4.7.

6.5.2 Transfer part of the solution (6.5.1) into a 1 cm cuvette; take the reagent blank

as a reference. At a wavelength of 520 nm of the spectrophotometer, measure its absorbance. Use beryllium oxide content as the x-coordinate; take its absorbance as the y-coordinate; draw a working curve.

7 Calculation of Analysis Result

The mass fraction w of beryllium oxide, expressed in (%), shall be calculated in accordance with Formula (1):

Where,

m_1 ---the beryllium oxide content obtained through the working curve, expressed in (μg);

m_0 ---the mass of the sample, expressed in (g);

V_1 ---the volume of the transferred test solution, expressed in (mL);

V_0 ---the total volume of the test solution, expressed in (mL).

8.1 Repeatability

In terms of the determined value of two independent test results obtained under repeatability conditions, within the range of average value provided below, the absolute difference between the two results does not exceed the repeatability limit (r); the circumstance of exceeding the repeatability limit (r) does not exceed 5%. The

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