

ICS 77.120.99
CCS H 64

YS

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

YS/T 509.4-2008

**Methods for chemical analysis of spodumene and lepidolite
concentrates. Determination of aluminium oxide content. EDTA
compleximetric method
(English Translation)**

Issued on: March 12, 2008

Implemented on: September 1, 2008

Issued by: National Development and Reform Commission of China

Table of Contents

Foreword...	3
1 Scope...	5
2 Method summary...	5
3 Reagents...	5
4 Specimen...	7
5 Analysis steps...	7
6 Calculation of analysis result...	8
7 Precision...	9
8 Quality assurance and control...	9

Foreword

YS/T 509 "Methods for chemical analysis of spodumene and lepidolite

concentrates" consists of the following 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 fluorine content - Ion selective electrode 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 4.

This Part replaces YS/T 509.4-2006 "Methods for chemical analysis of spodumene and lepidolite concentrates The EDTA volumetric method for the determination of aluminum oxide content" (previous edition is GB/T 3885.4-1983).

Compared with YS/T 509.4-2006, the main changes in this Part are as follows:

- modified the titer (T) of lead standard solution and aluminum oxide to the concentration of the substance;

Methods for chemical analysis of spodumene and lepidolite concentrates - Determination of aluminum oxide content - EDTA compleximetric method

1 Scope

This Part specifies the determination methods for aluminum oxide content in spodumene, lepidolite concentrates.

This Part is applicable to the determination of aluminum oxide content in spodumene, lepidolite concentrates. Determination range: 10.00%~30.00%.

2 Method summary

The test material is melted with potassium hydroxide. Use water to leach. Pipette part of the solution. Add excessive EDTA. Boil complexed aluminum at pH5~pH6. Excessive EDTA uses xylenol orange as indicator. Use lead standard solution to back drip. Add fluoride. Use lead standard solution to titrate the released EDTA. Calculate the amount of aluminum oxide from the volume of

lead standard solution consumed.

3 Reagents

Unless otherwise stated, only the confirmed analytically-pure reagents and distilled water or water of comparable purity are used in the analysis.

3.7 Buffer solution (pH5.5): Dissolve 120.5g of anhydrous sodium acetate in water. Add 10mL of glacial acetic acid. Transfer to a 1000mL volumetric flask.

V1 - Volume of lead standard solution (3.10) consumed to titrate aluminum oxide, in milliliters (mL);

V0 - Volume of lead standard solution (3.10) consumed to titrate blank solution, in milliliters (mL);

0.05098 - Amount of aluminum oxide equivalent to 1.00mL of lead standard solution [$c(\text{Pb})=1.0000\text{mol/L}$], in grams per mole (g/mol).

Conduct parallel calibration in triplicate. The extreme deviation value of the consumed lead standard solution (3.10) shall not exceed 0.05mL. Take the average value. Otherwise, recalibrate.

4.1 Spodumene concentrate shall pass through a sieve with an aperture of 0.074mm. Lepidolite concentrate shall pass through a sieve with an aperture of 0.105mm.

4.2 The specimen is pre-baked at 105°C~110°C for 2h. Place in a desiccator to cool to room temperature.

5.1 Test material

Weigh 0.25g of specimen, to the nearest of 0.0001g.

5.2 Number of determinations

Make parallel determinations of two test materials. Take the average value.

5.3 Blank test

Conduct blank test with test material.

5.4.1 Place the test material (5.1) in a 30mL silver crucible. Add 5 drops of

absolute ethanol (3.3) to moisten. Add 4g of potassium hydroxide (3.1). Put the

lid on the crucible and leave a little gap. Remove moisture on an electric stove.

Place in 600°C~650°C high temperature furnace to melt for 10min~15min. Take

.....