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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 17413.1-2010

Replacing GB/T 17413.1-1998

Methods for chemical analysis of lithium, rubidium and cesium ores - Part 1: Determination of lithium content

锂矿石、铷矿石、铯矿石化学分析方法 第1部分：锂量测定

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1 Scope

GB/T 17413.1-2010 is the Chinese national standard on methods for chemical analysis of lithium, rubidium and cesium ores - part 1: determination of lithium content, in the field of mining and minerals. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 10 November 2010 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 February 2011. Classification: ICS 73.060, CCS D43. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This part of GB/T17413 specifies the methods for determining the amount of lithium oxide in lithium ores, rubidium ores, and cesium ores. This part applies to lithium ores, rubidium ores, and cesium ores, and also applies to the determination of lithium oxide content in tantalum, niobium ores, and rare earth ores. Measuring range: 10 μg/g~4x104 μg/g lithium oxide.

2 Normative references

The provisions in the following documents become the provisions of this part through

reference in this part of

GB/T 17413. For the dated references, the subsequent amendments (excluding corrections) or revisions do not apply to this standard, however, parties who reach an agreement based on this standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest editions of the referenced documents apply to this standard.

GB/T 6682 Water for analytical laboratory use - Specification and test methods

3 Principle

The sample is decomposed by hydrofluoric acid and sulfuric acid, in 1% sulfuric acid medium, on an atomic absorption spectrophotometer at a wavelength of 670.8 nm, with an air-acetylene flame, measured for the absorbance or emission intensity of lithium oxide, and then the amount of lithium oxide is calculated.

4 Reagents

Unless otherwise stated, analytical grade reagents and analytical laboratory water complying with GB/T 6682 are used in the analysis.

4.1 Hydrofluoric acid (rho

1.13 g/mL). WARNING: Hydrofluoric acid is toxic and corrosive. Wear gloves when operating to prevent contact with the skin!

4.2 Hydrochloric acid (rho

4.3 Sulfuric acid (1+1). WARNING: Improper operation during dilution may cause burns!

4.4 Lithium oxide standard solution:

a) Lithium oxide standard stock solution: Weigh 1.2364 g of spectrally pure lithium carbonate (dry at 105 °C~110 °C for 2 hours and place in a desiccator to cool to room temperature), place it in a 400 mL beaker, add 200 mL of water, and cover with a watch glass; slowly add a small amount of hydrochloric acid (4.2) to completely dissolve it, heat the solution to boil to drive out the carbon dioxide, remove the solution, and cool it; wash the watch glass with water, transfer the solution to a 500 mL volumetric flask, dilute it with water to the mark, and shake well. The mass concentration of lithium oxide in this solution is

b) Lithium oxide standard solution: Pipette

25.00 mL of lithium oxide standard stock solution [4.4a)], place it in a 500 mL volumetric flask, dilute to the mark with water, and shake well. The mass concentration of lithium oxide

in this solution is 50.00 μg/mL.

5 Apparatus

5.1 Atomic absorption spectrophotometer (with emission function). A lithium hollow cathode lamp is attached.

5.2 Analytical balance: Level 3, and the sensitivity is

0.1 mg.

6 Sample

6.1 The particle size of the sample shall be less than 74 μm.

6.2 The sample is dried in an oven at 105 °C for 2 h~4 h, and placed in a desiccator to cool to room temperature for later use.

7.5 Preparation of calibration solution series Take

0.00 mL,

10.00 mL lithium oxide standard solution [4.4b)] into a series of 50 mL volumetric flasks, add 1 mL of sulfuric acid (4.3), dilute with water to the mark, and shake well. The mass concentrations of lithium oxide in this series of solutions are 0.00 μg/mL, 1.00 μg/mL, 2.00 μg/mL, 4.00 μg/mL, 6.00 μg/mL, 8.00 μg/mL, and 10.00 μg/mL.

7.6 Determination WARNING: The air-acetylene flame shall be ignited or extinguished according to the usage regulations of the atomic absorption spectrophotometer to avoid possible explosion hazards! Use a flame atomic absorption spectrophotometer to measure the absorbance or emission intensity of lithium oxide in the calibration solution series, blank solution and sample solution (

7.4.1 and 7.4.2) at a wavelength of 670.8 nm according to the instrument working conditions (see Appendix A).

7.7 Drawing of the calibration curve Taking the amount of lithium oxide as the abscissa and the absorbance or emission intensity as the ordinate, draw a calibration curve, and obtain the corresponding amount of lithium oxide from the calibration curve.