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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 18114.4-2010

Replacing GB/T 18114.5-2000

**Chemical analysis methods of rare earth concentrates - Part 4:
Determination of niobium oxide, zirconium oxide and titanium oxide
contents - Inductively coupled plasma atomic emission spectrometry**

稀土精矿化学分析方法 第4部分：氧化铌、氧化锆、氧化钛量的测定 电感耦合等
离子体发射光谱法

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Table of Contents

Foreword

1 Scope

2 Edition and transition

3 Classification and status

4 Structure of the document

5 The English edition

Foreword

GB/T 18114 "Methods for chemical analysis of rare earth concentrates" is divided into 11 parts.

--- Part 1. Determination of total rare earth oxide gravimetric method;

--- Part 2. Determination of thorium oxide content;

--- Part 3. Determination of calcium oxide content;

--- Part 4. niobium oxide, zirconium oxide, titanium oxide content - Inductively coupled plasma atomic emission spectrometry;

--- Part 5. aluminum oxide content - Inductively coupled plasma atomic emission spectrometry;

--- Part 6. Determination of the amount of silica;

--- Part 7. Determination of the amount of iron oxide dichromate method;

--- Part 8. fifteen rare earth element oxide with components measured by inductively coupled plasma atomic emission spectrometry;

--- Part 9. Determination of the amount of phosphorus pentoxide bismuth molybdenum blue spectrophotometric method;

--- Part 10. Determination of moisture content - Gravimetric method;

--- Part 11. Determination of the amount of fluorine EDTA titration. This is Part 4. This part is GB/T 18114.4-2000 "Methods for chemical analysis of monazite concentrates - Determination of the amount of titanium oxide", GB/T 18114.5- 2000 "Methods for chemical analysis of monazite concentrates - Determination of zirconium oxide content," the amendment. This portion of the GB/T 18114.4-2000, GB/T 18114.5-2000 compared to the main changes are as follows:

--- The titanium was determined by spectrophotometry, EDTA titration method for the determination of zirconium adjusted by inductively coupled plasma emission spectrometry, with Increases the determination of niobium content;

--- ZrO₂ by the measurement range of 0.50% to

1 Scope

GB/T 18114.4-2010 is the Chinese national standard on chemical analysis methods of rare earth concentrates - part 4: determination of niobium oxide, zirconium oxide and titanium oxide contents - inductively coupled plasma atomic emission spectrometry, in the field of metallurgy. 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 14 January 2011 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 November 2011. Classification: ICS 77.120.99, CCS H14. 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.

GB/T 18114 in the provisions of this part of the amount of niobium oxide, zirconium oxide content, determination of the amount of rare earth oxide concentrate. This section applies to niobium oxide, zirconium oxide content, determining the amount of rare earth oxide concentrate. Measuring range. Nb₂O₅. 0.070% ~ 0.20%; ZrO₂. 1.00% ~ 5.00%; TiO₂. 0.10% ~ 4.00%. Principle

2 Sample by sodium peroxide fusion with sodium decomposed by inductively coupled plasma emission spectrometer, in hydrofluoric acid medium plus standard Determination of the method low levels of titanium, niobium oxide, in hydrochloric acid medium Determination of high content of titanium oxide, zirconium oxide content standard curve.

3 Reagents and materials

3.1 sodium hydroxide.

3.2 sodium peroxide.

3.3 potassium pyrosulfate.

3.4 sulfate (rho1.84g/mL).

3.5 hydrochloride (rho1.19g/mL).

3.6 Hydrofluoric acid (rho1.14g/mL).

3.7 NaOH wash 20g/L.

3.8 Titanium dioxide standard stock solution. Weigh 0.1000g pre-burning 0.5h and cooled to room temperature in a dryer at 850 °C two Titanium oxide (purity > 99.99%) in a platinum crucible, add 4g potassium pyrosulfate (3.3), on the low-temperature furnace heated to remove moisture at 750 °C Muffle furnace melting 10min, coolish. 5mL and 50mL water with sulfuric acid (3.4) to extract, heated to dissolve frit, clear solution. Coolish Transferred to 200mL volumetric flask, dilute with water to volume, and mix this solution 1mL containing 500µg titanium dioxide. Titanium dioxide

3.9 Standard solution. standard dispensing 10.00mL titania stock solution (3.8) in 100mL volumetric flask, was added 5mL Hydrochloric acid (3.5), dilute to the mark, and mix the solution 1mL containing 50µg titanium dioxide.

3.10 zirconia standard stock solution. Weigh 0.1000g pre-burning 0.5h and cooled to room temperature in a dryer at 850 °C two Zirconia (purity > 99.99%) in a platinum crucible, add 4g potassium pyrosulfate (3.3), on the low-temperature heating furnace to remove moisture at 750 °C Muffle furnace melting 10min, coolish. 5mL and 50mL water with sulfuric acid (3.4) to extract, heated to dissolve frit, clear solution. Coolish Transferred to 200mL volumetric flask, dilute with water to volume, and mix this solution 1mL containing 500µg zirconium dioxide.

3.11 zirconium dioxide standard solution. dispensing 10.00mL zirconia standard stock solution (3.10) in 100mL flask, add 5mL hydrochloric acid (3.5), dilute to the mark, and mix the solution 1mL containing 50µg zirconium dioxide.

3.12 niobium pentoxide standard stock solution. Weigh 0.1000g pre-burning 0.5h and cooled to room temperature at 850 °C in the dryer Niobium pentoxide (purity > 99.99%) in a platinum crucible, add 4g potassium pyrosulfate (3.3), on the low-temperature heating furnace to remove moisture in 750 °C muffle furnace melting 10min, coolish. Polytetrafluoroethylene beaker of water and extracted with 50mL and 10mL hydrofluoric acid (3.6), heating Frit to dissolve, and the solution clear. Coolish, transferred to 100mL plastic volumetric flask, dilute with water to volume, and mix the solution containing 1mL 1000µg niobium pentoxide.