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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 12690.3-2015

Replacing GB/T 12690.3-2002

Chemical analysis methods for non-rare earth impurities in rare earth metals and their oxides - Part 3: Determination of the water content of rare earth oxides - Gravimetric method

稀土金属及其氧化物中非稀土杂质化学分析方法 第3部分：稀土氧化物中水分量的测定 重量法

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Foreword

GB/T 12690 "non - rare earth impurities in rare earth metals and their oxides chemical analysis method" is divided into 18 parts.

--- Part 1. Carbon and sulfur content was measured high frequency - infrared absorption method;

--- Part 2. Rare Earth Oxides loss on ignition - Gravimetric method;

--- Part 3. rare earth oxide in water content - Gravimetric method;

--- Part 4. oxygen, nitrogen pulse measurement - infrared absorption method and pulse - heating thermal conductivity;

--- Part 5. Determination of inductance aluminum, chromium, manganese, iron, cobalt, nickel, copper, zinc, lead coupled plasma emission spectrometry; Cobalt, manganese, lead, nickel, copper, zinc, aluminum, chromium was measured by inductively coupled plasma mass spectrometry;

--- Part 6. Determination of iron content of potassium thiocyanate, 1,10-phenanthroline spectrophotometry;

--- Part 7. Determination of silicon content - Molybdenum blue spectrophotometric method;

--- Part 8. Determination of sodium content by flame atomic absorption spectrometry;

--- Part 9. Determination of chlorine content of silver nitrate turbidimetry;

--- Part 10. Determination of phosphorus content - Molybdenum blue spectrophotometric method;

--- Part 11. Determination of magnesium content - Flame atomic absorption spectrometry;

--- Part 12. Determination of the amount of thorium;

--- Part 13. molybdenum, tungsten content was measured;

1 Scope

Part 3 of China's series on the chemical analysis of non-rare-earth impurities in rare earth metals and oxides, covering the water content of rare earth oxides by the gravimetric method. It sits beside Part 2 on the loss on ignition and answers a different question with a similar technique, which is why the two are easily confused and why they are separate parts. The loss on ignition is everything volatile at high temperature: water, but also carbonate, nitrate and chloride residues. The water content determined here is only the water, driven off by drying at a moderate temperature - and the difference between the two figures tells the producer something the individual numbers do not, namely how much of the volatile matter is water that will come off in a dryer and how much is chemically bound residue that will not. Commercially the water content is the more immediate number, because rare earth oxides are hygroscopic and pick up water in the bag: a consignment weighed on a humid day and paid for by mass carries water the purchaser did not intend to buy, and the water content is what corrects for it. The method is drying to constant mass at a specified temperature, with weighing before and after. What the standard has to fix is what makes the result reproducible: the drying temperature, which must remove the water without beginning on the carbonate, the time and the constant mass criterion, the sample size and preparation, and the cooling in a desiccator, since a hygroscopic material regains what it lost within minutes of leaving the oven. Issued on 11 September 2015 and in force since 1 April 2016, it replaces GB/T 12690.3-2002.

GB/T 12690 provisions of this part of the determination of rare earth oxides in the amount of moisture. This section applies to the determination of moisture content of rare earth oxides. Measuring range. 0.20% to 10.00%.

2 Principle of the method

Sample at 105 °C ~ 110 °C heated to completely evaporate moisture. Calculate the amount of water from the difference between before and after drying quality.

3 Instruments and equipment

3.1 weighing bottle. phi40mm, high 25mm.

3.2 Balance. dividing the value of 0.0001g.

3.3 oven. temperature > 110 °C.

4 Sample

The sample should be sealed packaging, weighing immediately after opening. Step

5 Analysis

5.1 Sample In addition to praseodymium oxide sample Weigh 5.0g sample (Chapter 4), accurate to 0.0001g. Praseodymium oxide Weigh 3.0g sample (Chapter 4), Accurate to 0.0001g.

5.2 Determination of the number of Weigh two samples, parallel determination of the mean value.

5.3 Determination

5.3.1 The sample (5.1) into constant weight weighing bottle (3.1), the half openings in the oven at 105 °C ~ 110 °C heating 1h, take out Weighing bottle, covered with lid, desiccator, cooled to room temperature, and weighed. Repeat operations 5.3.2

5.3.1 until constant mass.

6 Calculation and presentation of analysis results

According to equation (1) to calculate the moisture content.