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

GB/T 12690.2-2015

Replacing GB/T 12690.2-2002

Chemical analysis methods for non-rare earth impurities in rare earth metals and their oxides - Part 2: Determination of the loss on ignition 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2部分：稀土氧化物中灼减量的测定 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 2 of China's series on the chemical analysis of non-rare-earth impurities in rare earth metals and oxides, covering the loss on ignition of rare earth oxides by the gravimetric method. It is the simplest determination in the series and one of the most commercially important, because rare earth oxides are sold by mass and the loss on ignition is the part of that mass which is not product. A rare earth oxide as delivered carries adsorbed water, occluded water, residual carbonate and sometimes residual nitrate or chloride from the precipitation; heated to a high temperature all of that goes off, and what remains is the oxide itself. The loss on ignition is that difference, and it is what converts a delivered mass into a mass of the material the buyer is actually paying for. The method is weighing: a portion is dried, weighed, ignited at a specified temperature for a specified time, cooled in a desiccator and weighed again. Its apparent simplicity is deceptive, and the standard is written accordingly, because everything depends on conditions that are easy to get wrong - the ignition temperature and time, which must be enough to drive off everything volatile without beginning to reduce or volatilise the oxide itself, the cooling in a desiccator, since these oxides are hygroscopic and a sample left on the bench regains weight while it is being carried to the balance, and the constancy of mass criterion that decides when the ignition is finished. Issued on 11 September 2015 and in force since 1 April 2016, it replaces GB/T 12690.2-2002.

GB/T 12690 provisions of this part of the determination of rare earth oxides in the loss on ignition. This section applies to the determination of loss on ignition of rare earth oxides. Measuring range. 0.10% to 15.00%.

2 Method summary

Sample after 950 °C burning, burning is calculated by the difference between before and after the mass loss on ignition.

3 Instruments and equipment

3.1 Analytical balance. dividing the value of 0.0001g.

3.2 high-temperature furnace. temperature > 1000 °C.

4 Sample

After grinding the sample in an oven at 105 °C ~ 110 °C baking 1h, cooled to room temperature and placed in a desiccator and immediately weighed. Step

5 Analysis

5.1 Sample Weigh 1.50g ~ 2.00g sample (see Chapter 4), accurate to 0.0001g.

5.2 Determination of the number of Independently measured twice and averaged.

5.3 Determination

5.3.1 The sample (see 5.1) have been placed at 950 °C till constant weight porcelain crucible or platinum crucible at 950 °C burning 1h. Remove, slightly Cooled, placed in a desiccator to cool to room temperature, and weighed. Repeat operations 5.3.2

5.3.1 until constant mass porcelain crucible and burning objects.

6 Calculation and presentation of analysis results

According to equation (1) calculate the loss on ignition of mass fraction, expressed in%. $w = \frac{m_0 - m_1}{m_0} \times 100\%$ (1)