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**XB**

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

**XB/T 613.1-2010**

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**Chemical analysis methods of cerium-terbium oxide-Part 1:  
Determination of cerium oxide and terbium oxide contents-Inductively  
coupled plasma atomic emission spectrometry**

**(English Translation)**

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### Foreword

XB/T 613 "Chemical Analysis Method of Cerium Terbium Oxide" is divided into 2 parts.

---Part 1: Determination of the amount of cerium oxide and terbium oxide;

---Part 2: Lanthanum oxide, praseodymium oxide, neodymium oxide, samarium oxide, europium oxide, gadolinium oxide, dysprosium oxide, holmium oxide, erbium oxide, thulium oxide, Determination of the amount of ytterbium oxide, lutetium oxide and yttrium oxide.

This part is part 1 of XB/T 613.

This part is under the jurisdiction of the National Rare Earth Standardization Committee (SAC/TC229).

### 1 Scope

This section specifies the determination method of cerium oxide and terbium oxide content in cerium terbium oxide.

This section applies to the determination of cerium oxide and terbium oxide content in cerium terbium oxide. Measuring range. cerium oxide 58.00%~70.00%;

Terbium oxide 30.00%~42.00%.

## 2 Method principle

The sample is dissolved in nitric acid and hydrogen peroxide, in dilute nitric acid medium, and directly excited by an argon plasma light source for spectrometry.

## 3 Reagents and materials

### 3.1

Hydrogen peroxide (30%).

### 3.2

Nitric acid (1 1).

### 3.3

Nitric acid (1 19).

### 3.4

Standard storage solution of cerium oxide. Weigh 0.1000g of cerium oxide which has been burned at 900°C for 1h [ $w(\text{REO}) > 99.5\%$ ,  $w(\text{CeO}_2/\text{REO}) > 99.99\%$ ], place in a 100mL beaker, add 10mL nitric acid (3.2), add hydrogen peroxide (3.1) dropwise, dissolve at low temperature, transfer in a 100mL volumetric flask, dilute to the mark with water and mix well. 1mL of this solution contains 1mg of cerium oxide.

### 3.5

Standard storage solution of terbium oxide. Weigh 0.1000g terbium oxide that has been burned at 900°C for 1 hour [ $w(\text{REO}) > 99.5\%$ ,  $w(\text{Tb}_4\text{O}_7/\text{REO}) > 99.99\%$ ], place in a 100mL beaker, add 10mL nitric acid (3.2), add hydrogen peroxide (3.1) dropwise, dissolve at low temperature, transfer in a 100mL volumetric flask, dilute to the mark with water and mix well. This solution 1mL contains 1mg terbium oxide.

### 3.6

Argon [ $w(\text{Ar}) > 99.99\%$ ].

## 4 Instruments

### 4.1

Inductively coupled plasma emission spectrometer, resolution  $< 0.006\text{nm}$  (at.200nm).

### 4.2

Argon plasma light source.

## **5 Sample**

The sample was burned at 900 °C for 1h, placed in a desiccator, and cooled to room temperature.

### **6.1 Sample**

Weigh 0.10g sample (5), accurate to 0.0001g.

### **6.2 Number of determinations**

Weigh two samples (6.1), perform parallel determination, and take the average value.

### **6.3 Preparation of analysis test solution**

#### **6.3.1**

Place the sample (6.1) in a 50mL beaker, add 10mL of nitric acid (3.2), add a few drops of hydrogen peroxide (3.1), and dissolve at low temperature to dissolve completely, remove, cool to room temperature, transfer to a 100mL volumetric flask, dilute to the mark with water, and mix.