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

**XB/T 601.2-2008**

Replacing XB/T 601.2-1993; XB/T 601.3-1993; XB/T 601.4-1993; XB/T 601.5-1993; XB/T 601.7-1993; XB/T 601.8-1993

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**Chemical analysis methods of lanthanum boride -  
Determination of Fe, Ca, Mg, Cr, Mn, Cu, Co content - Inductively  
coupled plasma atomic emission spectrographic method  
(English Translation)**

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3.3 Argon ( >99.99%)

3.4 Hydroxylamine hydrochloride. excellent grade pure

### Foreword

This standard is divided into the following 5 parts.

XB/T 601.1-2008 Methods for chemical analysis of lanthanum hexaboride. Determination of boron content. Acid-base titration XB/T 601.2-2008 Methods for chemical analysis of lanthanum hexaboride Determination of iron, calcium, magnesium, chromium, manganese, and copper content inductively coupled plasma Emission spectroscopy XB/T 601.3-2008 Methods for chemical analysis of lanthanum hexaboride-Determination of tungsten content-Inductively coupled plasma emission spectrometry XB/T 601.4-2008 Methods for chemical analysis of lanthanum hexaboride. Determination of carbon content. High frequency induction combustion infrared absorption method XB/T 601.5-2008 Methods for chemical analysis of lanthanum hexaboride-Determination of acid-soluble silicon content-Silicon molybdenum blue spectrophotometric method this part is part 2. This part is based on XB/T 601.2-1993 "Methods for chemical analysis of lanthanum hexaboride flame atomic absorption spectrometry" Method for the determination of calcium content", XB/T 601.3-1993 "Methods for chemical analysis of lanthanum hexaboride flame atomic absorption spectrometry for the determination of magnesium content", XB/T 601.4-1993 "Methods for chemical analysis of lanthanum hexaboride for the determination of copper content by flame atomic absorption spectrometry", XB/T 601.5-1993 "6 Methods for chemical analysis of lanthanum boride. Determination of manganese content by flame atomic absorption spectrometry", XB/T 601.7-1993 "Methods for chemical analysis of lanthanum hexaboride Method 1,10-phenanthroline spectrophotometric method for the determination of iron content" and XB/T 601.8-1993 "Methods for chemical analysis of lanthanum hexaboride diphenyl semicarbazide Consolidated revision of "Spectrophotometric Determination of Chromium Content". This part is compatible with XB/T 601.2~601.5-1993, XB/T 601.7~601.8-1993 the main changes are as follows.

---Inductively coupled plasma emission spectrometry is used;

--- Added precision (repeatability) clause.

This part was proposed and managed by the National Rare Earth Standardization Technical Committee.

## 1 Scope

This section specifies the determination method of iron, calcium, magnesium, chromium, manganese and copper in lanthanum hexaboride.

This section applies to the determination of iron, calcium, magnesium, chromium, manganese, and copper content in lanthanum hexaboride. The measurement range is shown in Table 1.

Table 1

Measuring range of measuring elements (mass fraction)/% Iron 0.0050~0.50 Calcium 0.0050~0.30 Magnesium 0.0005~0.10 Chromium 0.0010~0.10 Manganese 0.0010~0.10 Copper 0.0010~0.10

## 2 Principles of the method

The sample was dissolved in nitric acid and directly excited by an argon plasma-based light source in a dilute nitric acid medium for spectrometry. Join the law school by standard the interference of the positive matrix to the measurement.

## 3 Reagents

### 3.1

Nitric acid (1+1), pure superior grade.

### 3.2

Hydrochloric acid (1+1), excellent grade pure.

### 3.4 Hydroxylamine hydrochloride. excellent grade pure

3.5 Chromium standard stock solution. Weigh 2.829g of potassium dichromate (reference reagent) baked at 110°C for 1 hour in a.200ml beaker and add 50mL nitric acid (3.1) is heated to dissolve; cooled to room temperature, transferred to a 1000mL volumetric flask, diluted with water to the mark, and mixed. This solution 1ml contains 1mg chromium. Dilute this solution with HNO<sub>3</sub> (5+95) into 1mL chromium standard solutions containing 100μg, 10μg and 1μg respectively.

3.6 Manganese standard stock solution. Weigh 1.5825g of manganese dioxide (>99.999%) baked at 110°C for 1h in a.200ml beaker and add 50ml hydrochloric acid (3.2), add a small amount of hydroxylamine hydrochloride (3.4), heat to dissolve, cool to room temperature, transfer to 1000ml volumetric flask, dilute with water to the mark, mix well. This solution

1mL contains 1mg manganese. Dilute this solution with HNO<sub>3</sub> (5+95) into 1mL containing 100μg and 10μg respectively and 1μg of manganese standard solution.

3.7 Iron standard stock solution. pipette 1.4298g of iron trioxide ( >99.999%) baked at 110°C for 1h into a.200ml beaker, Add 50mL hydrochloric acid (3.2) to heat to dissolve, cool to room temperature, transfer to a 1000mL volumetric flask, dilute to the mark with water, and mix. This solution 1ml contains 1mg iron. This solution was diluted with HNO<sub>3</sub> (5+95) into 1mL of iron standard solutions containing 100μg, 10μg and 1μg respectively.

3.8 Copper standard storage solution. Pipette 1.2518g of copper oxide ( >99.999%) baked at 110°C for 1h into a.200ml beaker, add 50mL nitric acid (3.1) is heated to dissolve, cooled to room temperature, transferred to a 1000mL volumetric flask, diluted with water to the mark, and mixed. This solution 1mL Containing 1mg copper, this solution was diluted with HNO<sub>3</sub> (5+95) into 1mL copper standard solutions containing 100μg, 10μg and 1μg respectively.

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