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

XB/T 610.1-2015

Replacing XB/T 610.1-2007

**Chemical analysis methods for samarium-cobalt permanent
magnet alloy. Part 1: Determination of samarium, cobalt, copper,
iron, zirconium, gadolinium, praseodymium content
(English Translation)**

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Foreword

XB/T 610-2015 "samarium cobalt permanent magnet alloy chemical analysis method" is divided into three parts.

--- Part 1. Determination of samarium, cobalt, copper, iron, zirconium, gadolinium, praseodymium;

--- Part 2. Determination of calcium and iron content atomic absorption spectrometry;

--- Part 3. Determination of oxygen content pulse - infrared absorption method.

This section XB/T 610.1 for the first part.

This section drafted in accordance with GB/T 1.1-2009 given rules.

This section replaces XB/T 610.1-2007.

This section compared with the XB/T 610.1-2007, the main technical changes are as follows.

--- Expand the scope of application, covering the samarium cobalt 1. 5 and samarium cobalt 2.17 permanent magnetic alloy powder;

--- Added Method 2 plasma emission spectrometry;

--- Instead of the original standard method of melting the filter paper method;

--- Added to the elemental copper, iron, zirconium, gadolinium, praseodymium amount determination;

--- Modify the quality of the sample, changed from 0.1g to 0.8g;

--- No longer using the vanadium internal standard correction.

This section contains X-ray fluorescence spectrometry (method 1) and inductively coupled plasma-atomic emission spectrometry (method 2). When two analytical methods when there is an overlap in the measurement range, use method 2 as the arbitration method.

This part of the National Rare Earth Standardization Technical Committee (SAC/TC229) and focal point.

This section is responsible for the drafting unit. Baotou Rare Earth Research Institute, Nonferrous Metal Technology Economics Research Institute.

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1 Scope

This section XB/T 610 provides samarium cobalt permanent magnet alloy samarium, cobalt, copper, iron, zirconium, gadolinium, praseodymium with the determination of the amount of components.

This section applies to the determination of samarium, cobalt, copper, iron, zirconium, gadolinium, praseodymium with 1. 5 type and 2.17 samarium-cobalt permanent magnet alloys. Method 1 and Method 2 Determination of the elements in Table 1.

Table 1

Component Measurement Range (with component) /% Sm 20.00 ~ 50.00 Co 40.00 ~ 80.00
Cu 0.10-10.00 Fe 0.10 ~ 20.00 Zr 0.10 to 5.00 Gd 0.10 ~ 10.00 Pr 0.10 ~ 10.00

2.1 Method principle

After the sample was pre-oxidized with concentrated nitric acid in a platinum crucible, anhydrous lithium tetraborate and lithium metaborate were added to the mixture to take ammonium bromide as a releasing agent, Melted in a melting sampler at 1050 ° C to make a glass sample, the appropriate mathematical model was selected to correct the matrix effect between elements, and X-ray fluorescence Spectrometric determination.

2.2 Reagents and materials

2.2.1

praseodymium oxide (Pr₆O₁₁). w (Pr₆O₁₁/REO) > 99.99%, at 950 °C burning 2h into the dryer to save.

2.2.2

Samarium oxide (Sm₂O₃). w (Sm₂O₃/REO) > 99.99%, burning at 950 °C 2h into the dryer to save.

2.2.3

gadolinium oxide (Gd_2O_3). w ($\text{Gd}_2\text{O}_3/\text{REO}$) > 99.99%, at 950 °C burning 2h into the dryer to save.

2.2.4

Cobalt Trioxide. Spectrum pure, bake at 105 °C 2h.

2.2.5

Copper oxide. 99.99%, baked at 105 °C for 2h.

2.2.6

Ferric oxide. 99.99%, bake at 105 °C 2h.

2.2.7

zirconium dioxide. pure spectrum, bake at 105 °C 2h.

2.2.8

anhydrous lithium tetraborate. bake at 105 °C 2h.

2.2.9

lithium metaborate. bake at 105 °C 2h.