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

XB/T 614.1-2011

**Chemical analysis method of gadolinium-magnesium alloy-Part
1: Determination of total rare earth content-Gravimetry
(English Translation)**

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Foreword

XB/T 614 "Methods for Chemical Analysis of Gadolinium Magnesium Alloys" is divided into 6 parts.

- Part 1: Determination of the total amount of rare earths by gravimetric method;
- Part 2: Determination of magnesium content EDTA titration;
- Part 3: Determination of carbon content high frequency-infrared absorption method;
- Part 4: Determination of fluorine content by steam distillation spectrophotometry;
- Part 5: Determination of rare earth impurities;
- Part 6: Determination of the amount of aluminum, calcium, copper, iron, nickel, and silicon inductively coupled plasma atomic emission spectrometry.

This part is part 1.

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

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1 Scope

This part of XB/T 614 specifies the method for determining the total amount of rare earths in gadolinium-magnesium alloys.

This section applies to the determination of the total amount of rare earths in gadolinium-magnesium alloys. The measurement range is 15.00%~90.00%.

2 Method principle

The sample is dissolved in hydrochloric acid, in the presence of ammonium chloride, the rare earth is precipitated in ammonia water, calcium, magnesium, etc. are separated, and the rare earth is dissolved in hydrochloric acid at a pH of 1.8 to 2.0 Precipitating rare earths with oxalic acid to separate iron, aluminum, nickel, etc. under the above conditions, burn them to constant weight at 950°C, weigh their mass, and calculate the total amount of rare earths.

3 Reagents and materials

3.1

Ammonium chloride.

3.2

Hydrochloric acid ($\rho=1.19\text{g/mL}$).

3.3

Nitric acid ($\rho=1.42\text{g/mL}$).

3.4

Perchloric acid ($\rho=1.67\text{g/mL}$).

3.5

Ammonia ($\rho=0.90\text{g/mL}$).

3.6

Hydrogen peroxide (30%).

3.7

Hydrochloric acid (1:1).

3.8

Ammonia (1:1).

3.9

Ammonium chloride-ammonia water washing solution. 100mL water contains 2.0g ammonium chloride (3.1) and 2.0mL ammonia water (3.5).

3.10

Oxalic acid solution (100g/L).

3.11

Oxalic acid lotion (2.0g/L).

3.12

m-cresol purple solution (1g/L, ethanol solution).

3.13

pH test paper (0.5~5.0).

4 Sample

Remove the surface oxide layer of the sample and weigh it immediately after sampling.

5.1 Sample

Weigh the sample (4) according to Table 1, accurate to 0.0001g.