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

XB/T 614.2-2011

**Chemical analysis method of gadolinium-magnesium alloy-Part
2: Determination of magnesium content-EDTA titrimetry
(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 2.

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 determination method of magnesium content in gadolinium magnesium alloy.

This section applies to the determination of magnesium content in gadolinium-magnesium

alloys. The measurement range is 10.00%~85.00%.

2 Method principle

The sample is dissolved in hydrochloric acid, and the rare earths are separated by ammonia. At pH=10, chrome black T is used as the indicator, and the magnesium content is titrated with EDTA standard solution.

3 Reagents and materials

3.1

Ammonium chloride.

3.2

Ammonia (1 1).

3.3

Hydrochloric acid (1 1).

3.4

Ammonia-ammonium chloride lotion (20g/L). 2g of ammonium chloride is dissolved in 100mL of water and adjusted to pH=9~10 with ammonia (3.2).

3.5

Chrome black T indicator. Take 1g of chrome black T indicator and 99g solid sodium chloride, grind, mix and dry, and store in a ground bottle for later use.

3.6

Ammonia buffer solution. Weigh 67.5g ammonium chloride dissolved in water, add 570mL ammonia, dilute to 1L with water, and mix.

3.7

Ferric chloride solution (2g/L).

3.8

Magnesium standard solution. accurately weigh 0.4146g of high-purity magnesium oxide, dissolve it with 5mL hydrochloric acid (3.3), transfer it into a 250mL volumetric flask, and use water Dilute to the mark and mix well. 1mL of this solution contains 1mg of magnesium.

3.9

hexamethylenetetramine..200g hexamethylenetetramine is dissolved in.200mL water, after dissolution, add 70mL hydrochloric acid (3.3), and dilute with water to 1L.

3.10

Xylenol orange (1g/L).

3.11

Zinc standard solution (0.03058mol/L). Weigh 0.5000g pure zinc (>99.9%) into a 250mL beaker, add 10mL water, 10mL hydrochloric acid (3.3), heated at low temperature until completely dissolved. Transfer the solution into a 250mL volumetric flask, add 2mL hydrochloric acid (3.3), and dilute with water to Scale and mix well.

3.12

EDTA standard solution [c(EDTA)~0.03mol/L].

3.12.1

Preparation. Weigh 2.2g EDTA in a 250mL beaker, dissolve it with a small amount of water, transfer it into a 200mL volumetric flask, and dilute with water to the mark, mix well.

3.12.2

Calibration. Pipette 20.00mL zinc standard solution (3.11) into a 250mL Erlenmeyer flask, add 50mL water, use hydrochloric acid (3.3) or ammonia Adjust the pH of the solution to 5~5.5 with water (3.2), add 5mL hexamethylenetetramine (3.9), 2 drops of xylenol orange (3.10), and dissolve it with EDTA standard the solution (3.12) is titrated until the solution turns from purple-red to bright yellow, which is the end point. Parallel calibration 3 copies, consumed EDTA standard solution (3.12) the range of the volume should not exceed 0.10mL, whichever is the average.

Calculate the actual concentration of EDTA standard solution (3.12) according to formula (1).

$$c=c_0 \times V_1/V_2$$