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

XB/T 617.1-2014

**Chemical analysis methods for neodymium iron boron alloy -
Part 1: Determination of total rare earth content - Oxalate
gravimetry**

钕铁硼合金化学分析方法 第1部分：稀土总量的测定 草酸盐重量法
(English Translation)

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Foreword

This document was issued on 14 October 2014 by the Ministry of Industry and Information Technology of the People's Republic of China, and has applied since 1 April 2015.

It is an XB/T standard: a recommended industry standard of China's rare earth industry.

XB/T 617, Chemical analysis methods for neodymium iron boron alloy, consists of seven parts: Part 1, determination of total rare earth content; Part 2, determination of fifteen rare earth elements; Part 3, determination of boron, aluminium, copper, cobalt, magnesium, silicon, calcium, vanadium, chromium, manganese, nickel, zinc and gallium contents by inductively coupled plasma atomic emission spectrometry; Part 4, determination of iron content by potassium dichromate titration; Part 5, determination of zirconium, niobium, molybdenum, tungsten and titanium contents by inductively coupled plasma atomic emission spectrometry; Part 6, determination of carbon content by high-frequency combustion infrared absorption; Part 7, determination of oxygen and nitrogen contents by pulse heating infrared absorption and thermal conductivity.

This part is Part 1 of XB/T 617.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This part is under the jurisdiction of the National Technical Committee on Rare Earth of Standardization Administration of China (SAC/TC 229).

1 Scope

This part of XB/T 617 specifies the method for the determination of total rare earth content in neodymium iron boron alloy.

This part is applicable to the determination of total rare earth content in neodymium iron boron alloy. The determination range is 19.00 % to 35.00 %.

2 Principle

The sample is decomposed with acid and the rare earths are precipitated with hydrofluoric acid, which separates them from the bulk of the iron and from trace magnesium. The rare earths are then redissolved and, at pH 1.8 to 2.0, precipitated with oxalic acid to separate the remaining iron.

The rare earth oxalate is ignited at 950 °C to rare earth oxide and weighed at constant mass.

3 Reagents and materials

3.1

Hydrofluoric acid ($\rho = 1.14 \text{ g/mL}$).

3.2

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

3.3

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

3.4

Hydrogen peroxide (30 %).

3.5

Hydrochloric acid (1+1).

3.6

Hydrofluoric acid washing solution (2+98).

3.7

Oxalic acid solution (100 g/L).

3.8

Ammonia solution (1+1).

3.9

Cresol red solution (2 g/L)

2 g of cresol red dissolved in 1 L of ethanol (1+1).

3.10

Oxalic acid washing solution (20 g/L).

3.11

Precision pH test paper (pH 0.5 to 5.0).

4 Instruments

4.1

Analytical balance, reading to 0.0001 g.

4.2

High-temperature furnace, capable of more than 1,000 °C.

4.3

Drying oven.

4.4

Platinum crucible.

5 Sample

The sample shall be weighed immediately after sampling.