

ICS 77.120.99

CCS H 14

XB

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

XB/T 617.5-2014

**Chemical analysis methods for neodymium iron boron alloy - Part 5:
Determination of zirconium, niobium, molybdenum, tungsten and titanium
contents - Inductively coupled plasma atomic emission spectrometry**

钕铁硼合金化学分析方法 第5部分：锆、铌、钼、钨和钛量的测定 电感耦合等离子体原子发射光谱法

(English Translation)

Issued on: October 14, 2014

Implemented on: April 1, 2015

**Issued by: Ministry of Industry and Information Technology of the
People's Republic of China**

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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 5 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 zirconium, niobium, molybdenum, tungsten and titanium contents in neodymium iron boron alloy.

This part is applicable to the determination of these elements in neodymium iron boron alloy. The determination range is 0.010 % to 0.50 %.

2 Principle

The sample is dissolved in nitric and sulfuric acids and the elements are measured with an inductively coupled plasma atomic emission spectrometer in dilute acid medium, the effect of the matrix on the measured elements being corrected by matrix matching.

3 Reagents and materials

3.1

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

3.2

Nitric acid (1+1).

3.3

Hydrochloric acid (1+1).

3.4

Sulfuric acid (1+1).

3.5

Zirconium standard stock solution

Weigh 1.0000 g of zirconium metal [$w(\text{Zr}) \geq 99.99 \%$] into a polytetrafluoroethylene beaker, add 5 mL of hydrofluoric acid (3.1) and dissolve with heat until clear; cool, transfer to a 1,000 mL volumetric flask, add 35 mL of hydrofluoric acid (3.1), dilute to the mark with water and mix. 1 mL of this solution contains 1 mg of zirconium. Store in a plastic bottle.

3.6

Niobium standard stock solution

Prepared as in 3.5 from 1.0000 g of niobium metal [$w(\text{Nb}) \geq 99.99 \%$]. 1 mL of this solution contains 1 mg of niobium. Store in a plastic bottle.

3.7

Molybdenum standard stock solution

Prepared as in 3.5 from 1.0000 g of molybdenum metal [$w(\text{Mo}) \geq 99.99 \%$]. 1 mL of this solution contains 1 mg of molybdenum. Store in a plastic bottle.

3.8

Tungsten standard stock solution

Prepared as in 3.5 from 1.0000 g of tungsten metal [$w(\text{W}) \geq 99.99 \%$]. 1 mL of this solution contains 1 mg of tungsten. Store in a plastic bottle.

3.9

Titanium standard stock solution

Prepared as in 3.5 from 1.0000 g of titanium metal [$w(\text{Ti}) \geq 99.99\%$]. 1 mL of this solution contains 1 mg of titanium. Store in a plastic bottle.

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