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

YS/T 861.5-2013

**Methods for chemical analysis of niobium-titanium alloy. Part 5:
Determination of titanium content-The ammonium ferric sulfate
titration**

铌钛合金化学分析方法 第5部分：钛量的测定硫酸铁铵滴定法

(English Translation)

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Foreword

YS/T 861 "niobium-titanium alloy chemical analysis method" is divided into five sections.

--- Part 1. aluminum, nickel, silicon, iron, chromium, copper, tantalum content - Inductively coupled plasma atomic emission spectrometry;

--- Part 2. oxygen, the determination of nitrogen inert gas fusion infrared absorption/thermal conductivity method;

--- Part 3. Determination of hydrogen content of inert gas fusion thermal conductivity method;

--- Part 4. Determination of carbon content in the high-frequency combustion infrared absorption method;

--- Part 5. Determination of the amount of titanium ammonium ferric sulfate titration.

This section YS/T 861 Part 5.

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

The non-ferrous metal part by the National Standardization Technical Committee (SAC/TC243) centralized.

This section is drafted. Western Metal Materials Co., Ltd., Northwest Nonferrous Metal Research Institute, Beijing Nonferrous Metal Research Institute.

1 Scope

YS/T 861 This part provides for determination of niobium-titanium alloy titanium content.

This section applies to the determination of niobium-titanium alloy titanium content, measurement range 40.00% ~ 60.00%.

2 Method summary

Hydrofluoric acid, nitric acid decomposition of the sample, niobium citrate complex. 20% to 30% sulfuric acid medium, under an inert atmosphere protected with aluminum foil Titanium (IV) reduction of titanium (III), potassium thiocyanate as indicator, titration solution titrated with ammonium ferric sulfate standard.

3 Reagents

Unless otherwise indicated, this part of the reagents were analytical reagent, which is a water or equivalent purity water.

3.1

sulfate ($\rho = 1.84\text{g/mL}$).

3.2

sulfate (11).

3.3

Hydrofluoric acid ($\rho = 1.15\text{g/mL}$).

3.4

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

3.5

citric acid solution. 400g/L.

3.6

saturated sodium bicarbonate solution.

3.7

Foil (mass fraction $\geq 99.95\%$).

3.8

Potassium thiocyanate solution. 250g/L.

3.9

ammonium ferric sulfate.

3.10

Titanium standard stock solution. Weigh 1.0000g of titanium (mass fraction $\geq 99.99\%$) in 500mL beaker covered with a watch glass, 100mL was added sulfuric acid (3.2), low-temperature heating the titanium is completely dissolved, was added dropwise nitric acid (3.4) until the solution is colorless, driving micro-boiling nitrogen oxides.

Cooled and transferred to 1000mL volumetric flask, dilute with water to volume, and mix. This solution 1mL containing 1.0mg titanium.

3.11

ammonium ferric sulfate standard titration solution. about 0.02mol/L.

3.11.1

preparation.

Weigh 48g of ammonium ferric sulfate (3.9) in 2000mL beaker, 500mL of water, sulfuric acid was slowly added 250mL (3.1), low temperature Heated to dissolve, cooled and transferred to 5000mL reagent bottle, dilute with water to volume, and mix.

3.11.2

Calibration.

Pipette three 20.00mL titanium standard solution (3.10), respectively, 500mL Erlenmeyer flask, add 90mL water, according to the following points 5.4.2 Analysis steps. (3.11) very poor value volume of ammonium ferric sulfate standard titration solution consumed parallel calibration should not exceed 0.10mL, whichever average value.

While doing the blank test.

According to equation (1) Calculation Titration factor.