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YS

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

YS/T 539.11-2009

Replacing YS/T 539.11-2006

**Methods for chemical analysis of nickel base alloy powder. Part
11: Determination of tungsten content. Cinchonine gravimetric
analysis**

镍基合金粉化学分析方法 第11部分：钨量的测定辛可宁称量法
(English Translation)

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Table of Contents

Foreword
1 Scope
2 Method summary
3 Reagents
4 Instrument

Foreword

YS/T 539 "nickel-based alloy powder chemical analysis method" is divided into 13 parts.

- Part 1. Determination of the amount of boron acid-base titration;
- Part 2. Determination of the amount of chrome aluminum Azure S Spectrophotometry;
- Part 3. Determination of silicon content of perchloric acid dehydration gravimetric method;
- Part 4. Determination of chromium content of ammonium persulfate oxidation titration;
- Part 5. Determination of manganese content of sodium periodate (K) oxidation spectrophotometry;
- Part 6. Determination of iron content of titanium trichloride - potassium dichromate titration;
- Part 7. Determination of cobalt content nitroso R salt spectrophotometric method;
- Part 8. Determination of copper content Neocuproine - chloroform extraction spectrophotometric method;
- Part 9. Determination of copper content of sodium thiosulfate iodometry;
- Part 10. Determination of molybdenum content - Thiocyanate spectrophotometric method;
- Part 11. Determination of cinchonine gravimetric method tungsten content;
- Part 12. Determination of phosphorus content of n-butyl alcohol - chloroform extraction spectrophotometric method;
- Part 13. Determination of oxygen pulse heating inert gas fusion - infrared absorption method.

This section is YS/T 539 Part 11.

The partial replacement of YS/T 539.11-2006 "Determination of tungsten content of nickel base alloy powder chemical analysis of cinchonine gravimetric method." this portion of YS/T 539.11-2006 phase comparator major changes are as follows.

--- Increasing the foreword;

--- Complements the repeatability limit.

The non-ferrous metal part by the National Standardization Technical Committee and centralized.

This section is responsible for drafting unit. Beijing Nonferrous Metal Research Institute, China Nonferrous Metals Industry Institute of Standards and Metrology and Quality.

This section is drafted. Beijing Nonferrous Metal Research Institute, Steel Research Institute.

1 Scope

YS/T 539 This part specifies the method for determination of nickel-base alloy powder of tungsten content.

This section applies to the determination of nickel base alloy powder of tungsten content measurement range. 1% to 15%.

2 Method summary

The sample is dissolved by acid in the hydrochloric acid solution, the nitric oxide, tungsten to form a precipitate tungstic acid, tungsten acid caprylate Ning complete precipitation, filtration, Burning, in addition to the volatile silicon with hydrofluoric acid, and then burning, weighing, tungsten trioxide is impure quality. With sodium carbonate melt, hot water after taking dissolved filtration, Determination of the amount of molybdenum trioxide filtrate insoluble residue burning weighing, never pure tungsten oxide quality subtracting these oxide mass, that is, pure oxide Quality tungsten.

3 Reagents

Unless otherwise indicated in the analysis using only recognized as analytical grade reagents and distilled or deionized water or equivalent purity.

3.1

anhydrous sodium carbonate.

3.2

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

Nitrate 3.3 ($\rho=1.42\text{g/mL}$).

3.4

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

3.5

perchloric acid ($\rho=1.69\text{g/mL}$).

3.6

HCl (1 + 1).

3.7

sulfate (1 + 1).

3.8

phosphoric acid (1 + 1).

Ammonia 3.9 (1 + 1).

3.10

copper sulphate solution (10g/L).

3.11

ammonium carbonate solution (50g/L).

3.12

ammonium citrate solution (500g/L).

3.13

ammonium thiocyanate solution (500g/L).

3.14

thiourea solution (50g/L). Weigh 5g of thiourea was dissolved in 100mL boiling water.

3.15

cinchonine solution (125g/L). Weigh 12.5g cinchonine, dissolved and diluted to 100mL with hydrochloric acid (3.6).

3.16

cinchonine lotion (3.75g/L). Pipette 30mL cinchonine solution (3.15), diluted with water to 1000mL.

3.17

Mo standard stock solution. Weigh 0.2000g pure molybdenum ($(\text{Mo}) \geq 99.99\%$), plus a small amount of nitric acid (3.3) dissolved, add 10mL sulfur Acid (3.7) and heated to take the fuming sulfuric acid, dissolved after cooling with water moved into 1000mL volumetric flask, dilute with water to volume, and mix. This solution 1mL containing 200 μg

molybdenum.

3.18

Molybdenum standard solution. Pipette 25.00mL molybdenum standard stock solution (3.17), in 100mL volumetric flask, dilute to the mark, mix uniform. This solution 1mL containing 50 μ g molybdenum.

4 Instrument

Spectrophotometer.