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

YS/T 953.2-2014

**Methods for chemical analysis of fire smelting nickel substrate material. Part 2:
Determination of silicon content. Molybdosilicate blue spectrophotometric
method and perchloric acid dehydration gravimetric method**

火法冶炼镍基体料化学分析方法 第2部分：硅量的测定硅钼蓝分光光度法和高氯
酸脱水重量法

(English Translation)

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Table of Contents

- Foreword
- 1 Scope
- 2 Normative references
- 3.1 Method summary
- 3.2 Reagents

Foreword

YS/T 953 "pyro-metallurgical materials for chemical analysis of nickel substrate" is divided into 11 parts.

- Part 1. Determination of the amount of nickel dimethylglyoxime spectrophotometry and dimethylglyoxime gravimetric method;
- Part 2. Determination of the amount of silicon molybdenum blue spectrophotometric method and perchloric acid dehydration gravimetric method;
- Part 3. Determination of phosphorus content of bismuth phosphorus molybdenum blue spectrophotometric method;
- Part 4. Determination of chromium content ammonium ferrous sulfate titration;
- Part 5. Determination of manganese content - Potassium periodate spectrophotometric method;
- Part 6. Determination of cobalt content of 5-Cl-PADAB spectrophotometry and flame atomic absorption spectrometry;
- Part 7. Determination of copper content bicyclic cyclohexanone oxalyl Spectrophotometric Method and flame atomic absorption spectrometry;
- Part 8. Determination of iron content dichromate method;
- Part 9. Carbon and sulfur content was measured high-frequency combustion infrared absorption method;
- Part 10. nickel, chromium, manganese, cobalt, copper, phosphorus content - Inductively coupled plasma atomic emission spectrometry;
- Part 11. lead, arsenic, cadmium, mercury content - Inductively Coupled Plasma Mass Spectrometry.

This is Part 2 YS/T 953, wherein the method of arbitration law.

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.

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1 Scope

YS/T of the provisions of section 953 determination pyrometallurgical nickel substrate compound silicon molybdenum blue spectrophotometric method and perchloric acid dehydration gravimetric method the amount of silicon.

This section applies to the determination of pyrometallurgical nickel substrate compound of silicon content. 1 measured in the range of 0.10% to 2.00%; the second measurement method in the range of 0.50% - 6.00%.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version suitable for use herein Member. For undated references, the latest edition (including any amendments) applies to this document.

GB/T 20066 Steel and iron - Sampling and determination of the chemical composition of the sample with a sample preparation method 3 1 silicon molybdenum blue spectrophotometry

3.1 Method summary

Samples with sulfur nitrate mixed acid dissolved. In acid medium, silicic acid and ammonium molybdate generation silicon molybdenum heteropoly acid, in the presence of oxalic acid to reduce it to Silicon molybdenum blue at 810nm wavelength spectrophotometer, the absorbance was measured to calculate the amount of silicon.

3.2 Reagents

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

3.2.1

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

3.2.2

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

3.2.3

sulfur nitrate mixed acid (sulfuric acid. nitric acid. water = 50.8.942).

3.2.4

potassium permanganate solution (40g/L).

3.2.5

Hydrogen peroxide (14).

3.2.6

ammonium molybdate solution (50g/L).

3.2.7

oxalic acid solution (50g/L).

3.2.8

ferrous ammonium sulfate solution (60g/L). 5mL per 100mL containing sulfuric acid.

3.2.9

Silicon standard solution.

3.2.9.1

silicon standard stock solution (100 $\mu\text{g/mL}$). Weigh 0.2140g by burning 1100 °C 1h of silica ($w_{\text{Si}} \geq 99.9\%$) Upon platinum crucible, added 8g of anhydrous sodium carbonate, thoroughly mixed, melted at 1050 °C for 30min, then cooled to 200mL PTFE Ethylene beaker, and washed with an appropriate amount of water leaching platinum crucible, and then the solution was transferred to 1000mL volumetric flask, dilute to the mark with water, Mix well. Store in a polyethylene bottle.

3.2.9.2

Silicon standard solution (10 $\mu\text{g/mL}$). Pipette 10.00mL silicon standard solution (3.2.9.1) in 100mL polyethylene flask to