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

YS/T 953.5-2014

**Methods for chemical analysis of fire smelting nickel substrate
material. Part 5: Determination of manganese content.
Potassium periodate spectrophotometric method**

火法冶炼镍基体料化学分析方法 第5部分：锰量的测定高碘酸钾分光光度法
(English Translation)

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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 section YS/T Part 5 953.

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 of the potassium periodate spectrophotometric determination pyrometallurgical nickel substrate compound of manganese content.

This section applies to the determination of pyrometallurgical nickel substrate compound and manganese contents. Determination range of 0.010% to 2.00%.

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 20066-2006 Steel and iron - Sampling and determination of the chemical composition of the sample with a sample preparation method

3 Method summary

Mixing the sample with nitric acid to dissolve the salt. Perchloric acid, phosphoric acid, manganese oxide by Potassium seven purple high price of manganese, in Spectrophotometer at a wavelength of 530nm absorbance measurement to calculate the amount of manganese.

4 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.

4.1

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

4.2

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

4.3

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

4.4

phosphoric acid - perchloric acid mixture (31). three phosphoric acid ($\rho = 1.69\text{g/mL}$) and a perchloric acid ($\rho = 1.67\text{g/mL}$) and mix.

4.5

high potassium iodate solution (5%). Weigh 5.00g potassium periodate, placed in 250mL beaker, add 60mL water, 20mL of nitric acid (4.2), After warming to dissolve, cooled, diluted with water to 100mL, and mix.

4.6

sodium nitrite solution (1%).

4.7

manganese standard solution.

4.7.1

Manganese standard stock solution ($500\mu\text{g/mL}$). Weigh 0.5000g manganese ($\text{wMn} \geq 99.9\%$) (to be pre-placed manganese sulfate (595) cleaning, until the surface of the manganese oxide washed out, immediately washed repeatedly with distilled water, and then placed in anhydrous ethanol washed 4 to 5 times, Out on a dryer and dried before use), placed in 250mL beaker, add 10mL water, 10mL of nitric acid (4.2), dissolved by heating, Boil drive to make nitrogen oxides, remove the cooled to room temperature and transferred to 1000mL volumetric flask, dilute with water to volume, and mix.

4.7.2

manganese standard solution ($100\mu\text{g/mL}$). Pipette 20.00mL manganese standard solution (4.7.1) in 100mL flask, add 1mL nitrate Acid (4.2), dilute to the mark and mix.

4.8

without reducing water species. deionized water (or distilled water) heated to boiling, with 10mL per liter of sulfuric acid (13) and acidified, not fresh high Iodate, continue to boil for a few minutes, after cooling use.