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

YS/T 325.4-2009

Replacing YS/T 325-1994

**Methods for chemical analysis of nickel-copper alloy. Part 4:
Determination of manganese content. The flame atomic
absorption spectrometric method**

镍铜合金化学分析方法 第4部分：锰量的测定 火焰原子吸收光谱法

(English Translation)

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Table of Contents

Foreword
1 Scope
2 Principle of the method
3 Reagents
4 Instrument
5 Sample

Foreword

YS/T 325-2009 "nickel-copper alloy chemical analysis method" a total of six sections.

- Part 1. Determination of nickel content Na₂EDTA titration
- Part 2. Determination of copper content - Gravimetric method electrolysis
- Part 3. Determination of iron content by flame atomic absorption spectrometry
- Part 4. Determination of manganese content by flame atomic absorption spectrometry
- Part 5. Determination of aluminum content Na₂EDTA titration
- Part 6. Determination of the amount of titanium di Zhao DAM spectrophotometry this section YS/T Part 4 325.

The partial modification of the use of ISO 7530-6:1990 "nickel alloys by flame atomic absorption spectrometry - Part 6. Determination of the amount of manganese" in the main to the technical content of ISO 7530-6:1990 the same structure not correspond exactly to write. Specific technical difference in Appendix A, Appendix B.

The partial replacement of YS/T 325-1994 Determination of manganese content of "nickel-copper alloy (NCu28-2.5-1.5) chemical analysis methods".

This section compared with YS/T 325-1994, the main changes are as follows.

- Changed the measurement method, modified by ammonium ferrous sulfate titration flame atomic absorption spectrometry.
- Increasing the "range" "Method Synopsis" "instrument" of the content and requirements.
- Supplementary terms of quality assurance and control, increased precision terms.

This section in Appendix A, Appendix B is an informative annex.

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

centralized.

This section is responsible for drafting unit. aluminum Shenyang Nonferrous Metals Processing Co., Ltd.

Participated in the drafting of this section. High-tech copper sheets Co., Ltd., Guangzhou Nonferrous Metal Research Institute.

1 Scope

YS/T in this part 325 specifies the method for determination of nickel-copper alloy of manganese content.

This section applies to the determination of nickel-copper alloy of manganese content. Measurement range. 0.10 to 4.00%.

2 Principle of the method

After the sample was dissolved with nitric acid, and evaporated to dryness. Removal of nitric acid and hydrochloric acid. In hydrochloric acid medium, using air - acetylene flame in atomic absorption Spectrometer wavelength 279.5nm measured absorbance manganese. Strontium salt is added to eliminate nickel, titanium, silicon element interference (the other elements present in the alloy Do not interfere with the determination).

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

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

3.2

Hydrogen peroxide (300g/L).

3.3

nitric acid (1 + 1).

3.4

HCl (1 + 1).

3.5

strontium chloride solution. 15.2g of strontium chloride hexahydrate ($\text{SrCl}_2 \cdot 6\text{H}_2\text{O}$) transferred to 200mL beaker, 100mL of hot water in the ($50\text{ }^\circ\text{C} \sim 60\text{ }^\circ\text{C}$) was dissolved. Cooled and transferred to 1000mL volumetric flask, dilute to the mark and mix.

3.6

manganese standard stock solution. Weigh 1.000g metal manganese (Mn mass fraction $\geq 99.95\%$) placed in 400mL beaker, add 30mL of hydrochloric acid (3.4) and 2mL nitrate ($\rho 1.41\text{g/mL}$), heated to dissolve completely, was slowly added 0.5mL of hydrogen peroxide (3.2) and cooled.

Moved into 1000mL volumetric flask, add 50mL of hydrochloric acid (3.1), dilute to the mark and mix. 1mL solution containing 1mg manganese.

3.7

manganese standard solution. Pipette 50.00mL manganese standard stock solution (3.6) was placed in 500mL volumetric flask, was added 25mL of hydrochloric acid (3.1), Dilute with water to volume, and mix. This solution 1mL containing 100 μg manganese.

4 Instrument

Atomic absorption spectrometer, with a manganese hollow cathode lamp.

Under optimum working conditions for those who can reach the following indicators can be used.

--- Characteristic concentration. In line with the measuring solution matrix solution, characteristic concentration of manganese should not exceed 0.10 $\mu\text{g/mL}$.

--- Precision. measuring the absorbance of the standard solution 10 times the highest concentration, the standard deviation does not exceed 1.0% of the mean absorbance; with the lowest concentration of standard solution (not "zero" concentration of the standard) measuring the absorbance of 10 times, the standard deviation should not exceed the maximum concentration 0.5% of the average absorbance of the standard solution.

--- Linear curve. The curve is divided into five sections according to concentration, absorbance difference between the highest and the lowest segment of the segment absorbance difference Ratio of not less than 0.7.

5 Sample

Thickness of less than 1mm debris.