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

YS/T 281.10-2011

Replacing YS/T 281.10-1994

**Methods for chemical analysis of cobalt. Part 10: Determination
of nickel content. Flame atomic absorption spectrometry**

钴化学分析方法 第10部分：镍量的测定

(English Translation)

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Foreword

YS/T 281 "cobalt chemical analysis method" is divided into the following 20 parts.

Part 1. Determination of iron content - Sulfosalicylic acid spectrophotometric method Part 2. Determination of aluminum content - Chromazu S spectrophotometric method Part 3. Determination of silicon content - Molybdenum blue spectrophotometric method Part 4. Determination of arsenic content - Molybdenum blue spectrophotometric method - Part 5. Determination of phosphorus content - Molybdenum blue spectrophotometric method Part 6. Determination of magnesium content - Flame atomic absorption spectrometric method - Part 7. Determination of zinc content - Flame atomic absorption spectrometric method Part 8. Determination of cadmium content - Flame atomic absorption spectrometric method Part 9. Determination of lead content - Flame atomic absorption spectrometric method Part 10. Determination of nickel content - Flame atomic absorption spectrometric method - Part 11. Determination of copper and manganese - Flame atomic absorption spectrometric method - Part 12. Determination of arsenic, antimony, bismuth, tin and lead - Electrothermal atomic absorption spectrometry - Part 13. Determination of sulfur content - High frequency induction furnace combustion infrared absorption method - Part 14. Determination of carbon content - High frequency induction furnace combustion infrared absorption method - Part 15. Determination of arsenic, antimony, bismuth and tin - Hydride generation - Atomic fluorescence spectrometry - Part 16. Determination of the amount of arsenic, cadmium, copper, zinc, lead, bismuth, tin, antimony, silicon, manganese, iron, nickel, aluminum and magnesium.

Spectrum method

- Part 17. Determination of aluminum, manganese, nickel, copper, zinc, cadmium, tin, antimony, lead and bismuth inductively coupled plasma mass spectrometry - Part 18. Determination of sodium content - Flame atomic absorption spectrometric method - Part 19. Determination of calcium, magnesium, manganese, iron, cadmium and zinc - Inductively coupled plasma emission spectrometric method - Part 20. Determination of the

amount of oxygen - Infrared absorption method this section is part 10 of YS/T 281.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This part replaces YS/T 281.10-1994 "cobalt chemical analysis method flame atomic absorption spectrometry for the determination of nickel content". versus YS/T 281.10-1994 compared to this part of the main changes are as follows.

- the lower limit of determination from 0.004% to 0.002%;
- The text format has been modified to supplement the quality assurance and control terms, increasing the repeatability and reproducibility limits;
- Added the requirements for the test report.

This part of the National Nonferrous Metals Standardization Technical Committee (SAC/TC243) proposed and centralized.

This standard is responsible for drafting units. Jinchuan Group Co., Ltd., Beijing Mining and Metallurgy Research Institute.

This part is responsible for drafting unit. Jiangsu Kailike Cobalt Industry Co., Ltd.

This part participates in the drafting unit. Jinchuan Group Co., Ltd., Beijing Nonferrous Metals Research Institute, Shenzhen Green US High-tech Co., Ltd.

Limited company.

1 Scope

This part of YS/T 281 specifies the determination of nickel content in cobalt.

This part applies to the determination of nickel in cobalt. Measuring range. 0.0020% ~ 0.60%.

2 Method summary

The sample was decomposed with nitric acid, and in a dilute nitric acid medium, an air-acetylene flame was used on an atomic absorption spectrometer at a wavelength of 232.0 nm the absorbance of nickel was measured.

The standard solution should contain the same concentration of cobalt matrix as the sample solution.

3 Reagent

If no special instructions, the reagents used for the analysis of pure reagents, preparation and analysis of water are secondary distilled water or considerable purity of the experiment Room water.

3.1 Metal cobalt (wCo $\geq$ 99.98%, wNi 99.95%) in 250mL beaker, add 10mL nitric acid

(3.3), heating dissolved completely, add 20mL water, boil 1min, cooled to room temperature and then moved into 1000mL volumetric flask, with nitric acid (3.4) Capacity, mix. This solution 1mL containing 1mg nickel.

3.6 nickel standard solution. remove 25.00mL nickel standard storage solution (3.5) in a 500mL volumetric flask, with nitric acid (3.4) fixed capacity, mixed uniform. 1 mL of this solution contains 50 μ g of nickel.

3.7 Cobalt matrix solution. Weigh 10 g of metal cobalt (3.1) in a 400 mL beaker, add water to cover the sample, add 60 mL of nitric acid (3.3), cover the surface dish, heat to dissolve completely, slightly boil off the nitrogen oxide, remove and cool to room temperature. Into the 100mL volumetric flask, Water volume, mix. This solution contains 1 mL of 100 mg of cobalt.

4 Instruments

Atomic absorption spectrometer with nickel hollow cathode lamp.

In the best working conditions of the instrument, who can achieve the following indicators can be used.

--- minimum sensitivity. in the solution with the sample solution consistent with the solution, the characteristic concentration of nickel should not be greater than 0.08 μ g/mL.