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

YS/T 281.11-2011

Replacing YS/T 281.11-1994

**Methods for chemical analysis of cobalt. Part 11: Determination
of copper and manganese contents. Flame atomic absorption
spectrometry**

钴化学分析方法 第11部分：铜、锰量的测定 火焰原子吸收光谱法
(English Translation)

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Foreword

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

- Part 1. Determination of iron content sulfonic acid spectrophotometry
- Part 2. Determination of the amount of chrome aluminum Azure S Spectrophotometry
- 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 spectrometry
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- Part 8. Determination of cadmium content by flame atomic absorption spectrometry
- Part 9. Determination of lead content - flame atomic absorption spectrometry
- Part 10. Determination of nickel content by flame atomic absorption spectrometry
- Part 11. Flame atomic copper, manganese content absorption spectrometry
- Part 12. arsenic, antimony, bismuth, tin, lead and determining the amount of electrothermal atomic absorption spectrometry
- Part 13. Determination of sulfur content high frequency induction furnace combustion infrared absorption method
- Part 14. Determination of the amount of carbon high-frequency induction furnace combustion infrared absorption method

--- Part 15. arsenic, antimony, bismuth contents - Hydride Generation - Atomic Fluorescence Spectrometry

--- Part 16. Determination of DC arc atomic arsenic, cadmium, copper, zinc, lead, bismuth, tin, antimony, silicon, manganese, iron, nickel, aluminum, magnesium content of the emitted light Spectroscopy

--- Part 17. aluminum, manganese, nickel, copper, zinc, cadmium, tin, antimony, lead, bismuth content - Inductively Coupled Plasma Mass Spectrometry

--- Part 18. Determination of sodium content by flame atomic absorption spectrometry

--- Part 19. calcium, magnesium, manganese, iron, cadmium, zinc content - Inductively coupled plasma atomic emission spectrometry

--- Part 20. Determination of oxygen content - Impulse - infrared absorption method this section YS/T 281 Part 11.

This section drafted in accordance with GB/T 1.1-2009 given rules.

The partial replacement of YS/T 281.11-1994 "cobalt chemical analysis by flame atomic absorption spectrometric method for the determination of copper, manganese content." versus YS/T 281.11-1994 compared, this section there are major changes as follows.

--- Measured by the scope of 0.0005% to 0.15% revised to 0.00050% to 0.30%;

--- Text format has been modified, supplemented with quality assurance and control provisions, increase the repeatability limit and reproducibility limit;

--- Complement the test reporting requirements.

The non-ferrous metal part by the National Standardization Technical Committee (SAC/TC243) and focal points.

1 Scope

This section YS/T 281 provides for determination of copper, cobalt, manganese content.

This section applies to cobalt Determination of copper, manganese content. Measurement range. 0.00050% to 0.30%.

2 Principle of the method

Sample decomposition with nitric acid, in dilute nitric acid medium, using air - acetylene flame atomic absorption spectrometer, respectively, at a wavelength of 324.7nm Absorbance was measured at copper, manganese absorbance was measured at 279.5nm.

In the standard solution and sample solution should contain the same concentration of cobalt matrix.

3 Reagents

Unless otherwise specified, the reagents were analytical reagent solution preparation and analysis are secondary distilled water or equivalent purity test Room with water.

3.1 Cobalt ($w_{\text{Co}} \geq 99.98\%$, $w_{\text{Cu}} 99.95$), manganese metal ($w_{\text{Mn}} > 99.95$) each 0.8000g, were placed

Two 400mL beaker, 40mL of nitric acid was added each (3.3), cover sheet pan and heated until complete dissolution, micro-boiling rid of nitrogen oxides, taking Under water and dish washing table Beibi, cooled to room temperature. They were transferred to 1000mL volumetric flask with water to volume, and mix. The solution 1mL Respectively containing 800 μ g copper, manganese.

3.6 mixed standard solution. Pipette each 10.00mL copper, manganese standard stock solution (3.5) in 100mL flask with water to volume, and mix.

This solution 1mL containing 80 μ g respectively, copper, manganese.

4 Instrument

Atomic absorption spectrometer, with copper, manganese hollow cathode lamp.

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

--- Sensitivity. basically the same test solution and measurement solution, characteristic concentration copper, manganese should not exceed 0.05 μ g/mL.

--- Precision. standard solution with the highest concentration of 10 times the absorbance measurements, the standard deviation should not exceed 1.5% of the average absorbance;

The lowest concentration of standard solution used (instead of "zero" standard solution) absorbance measured 10 times, and the standard deviation should not exceed the maximum concentration