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

YS/T 990.17-2015

Methods for chemical analysis of copper matte - Part 17: Determination of cobalt content - Atomic absorption spectrometry

冰铜化学分析方法 第17部分：钴量的测定 原子吸收光谱法

(English Translation)

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Foreword

YS/T 990 "Methods for chemical analysis of copper matte" is divided into 18 sections.

--- Part 1. Determination of copper content iodometry;

--- Part 2. Determination of the amount of gold and silver atomic absorption spectroscopy and fire assay gravimetric method;

--- Part 3. Determination of sulfur content - Gravimetric method and combustion titration method;

--- Part 4. Determination of the amount of bismuth atomic absorption spectrometry;

--- Part 5. Determination of the amount of fluorine ion selective electrode method;

--- Part 6. Determination of lead content - Atomic absorption spectrometry and Na2EDTA titration;

--- Part 7. Determination of cadmium content - Atomic absorption spectrometry;

--- Part 8. Determination of arsenic content by atomic fluorescence spectrometry, diethyl dithiocarbamate spectrophotometry and silver drops of potassium bromate Titration;

--- Part 9. Determination of iron content dichromate method;

--- Part 10. Determination of silicon dioxide content molybdenum blue spectrophotometric method and silicon potassium fluoride titration;

--- Part 11. Determination of the amount of nickel atom absorption spectrometry;

--- Part 12. Determination of the amount of chromium oxide of aluminum Azure S Spectrophotometry;

--- Part 13. Determination of magnesium oxide content - Atomic absorption spectrometry;

--- Part 14. Determination of the amount of zinc atomic absorption spectrometry and Na2EDTA titration;

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--- Part 15. Determination of antimony content - Atomic absorption spectrometry;

--- Part 16. Determination of mercury content - Cold atomic absorption spectrometry;

--- Part 17. Determination of the amount of cobalt atomic absorption spectrometry;

--- Part 18. lead, zinc, nickel, arsenic, bismuth, antimony, calcium, magnesium, cadmium, cobalt content - Inductively coupled plasma atomic emission spectrometry.

This is Part 17.

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.

This section is responsible for drafting unit. Zhongtiaoshan Nonferrous Metals Group Co., Ltd. Daye Nonferrous Metals Group Holdings Limited.

This section is drafted. Tianjin CIQ.

Participated in the drafting of this section. Ningbo Entry Inspection and Quarantine Bureau, Guangzhou Nonferrous Metal Research Institute, Hangzhou Fuchunjiang Smelting Co., Ltd., Lake South Yu Teng Nonferrous Metals Co., Ltd., Changshu CIQ.

1 Scope

This section YS/T 990 specifies the method for determination of copper matte cobalt content.

This section applies to the determination of copper in ice cobalt content. Measurement range (mass fraction) of 0.040% to 0.40%.

2 Method summary

Samples with hydrochloric acid, nitric acid, hydrofluoric acid and perchloric acid decomposition, dissolved salts with hydrochloric acid, filtration volume. In dilute hydrochloric acid medium, at an atomic absorption Close spectrometer at a wavelength of 240.7nm, using air - acetylene flame measured absorbance of cobalt, calculated the amount of cobalt.

3 Reagents

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

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3.1
hydrochloric acid (rho = 1.19g/mL).

3.2
hydrochloride (11).

3.3
nitric acid (rho = 1.42g/mL).

3.4
nitric acid (11).

3.5
Hydrofluoric acid (rho = 1.13g/mL).

3.6
perchloric acid (rho = 1.67g/mL).

3.7
cobalt standard stock solution. Weigh 1.0000g metal cobalt (wCo>=99.95%), placed in 300mL beaker, add 30mL of nitric acid (3.4) to dissolve completely get rid of nitrogen oxides and heated to boiling, cooled to room temperature and removed, transferred to 1000mL volumetric flask, dilute to the mark with water Degree, and mix. 1mL solution containing 1mg cobalt.

3.8
cobalt standard solution. Pipette 10.00mL cobalt standard stock solution (3.7) in 200mL volumetric flask, was added 10mL of nitric acid (3.4), with Dilute with water to volume, and mix. This solution 1mL containing 50μg cobalt.

4 Instrument

Atomic absorption spectrometer, with cobalt hollow cathode lamp.

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

--- Characteristic concentration. the test solution is consistent with the measurement of the solution, the concentration of cobalt features should not exceed 0.07μg/mL.

--- Precision. measuring the absorbance of 11 with the highest concentration of the standard solution, the standard deviation should not exceed 0.3% of the average absorbance;

The absorbance measured 11 times the minimum concentration of the standard solution

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(not a "zero" standard solution), and the standard deviation should not exceed the maximum concentration 0.5% of the mean absorbance of standard solution.

--- Linear curve. the curve according to concentration, divided into five sections, the difference between the absorbance of the absorbance difference between the highest and the lowest segment Ratio of not less than 0.70.

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