

ICS 77.120.30
CCS H 13

YS

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

YS/T 990.13-2014

**Methods for chemical analysis of copper matte. Part
13: Determination of magnesium oxide content. Atomic
absorption spectrometry**

冰铜化学分析方法 第13部分：氧化镁量的测定原子吸收光谱法
(English Translation)

Issued on: October 14, 2014

Implemented on: April 1, 2015

Issued by: Ministry of Industry and Information Technology

Table of Contents

Foreword
1 Scope
2 Method summary
3 Reagents
4 Instrument

Foreword

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

- Part 1 Determination of copper content iodometry;
- Part 2. Determination of gold and silver atomic absorption spectroscopy and fire assay;
- 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 hydride generation - atomic fluorescence spectrometry, diethyl dithiocarbamate spectrophotometry silver and potassium bromate titration;
- Part 9. Determination of iron content dichromate method;
- Part 10. Determination of silicon dioxide content molybdenum blue spectrophotometry 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;

- 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 section YS/T Part 13 990.

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. Daye Nonferrous Metals Group Holdings Limited.

Participated in the drafting of this section. Beijing Nonferrous Metal Research Institute, Tongling Nonferrous Metals Group Holdings Co., Ltd., Yunnan Copper shares have Ltd., Yu Teng Hunan Nonferrous Metals Co., Ltd., Tianjin, People's Republic of China Exit Inspection and Quarantine.

1 Scope

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

This section applies to the determination of copper ice MgO content. Determination of the range of 0.10 to 6.00%.

2 Method summary

Samples with hydrochloric acid, nitric acid, hydrofluoric acid, perchloric acid dissolved in dilute hydrochloric acid medium, adding a certain amount of strontium chloride interference suppression elements, use Air - acetylene flame atomic absorption spectrometer wavelength 285.2nm at (adjust the angle of the burner), measuring the absorbance of magnesium oxide.

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

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

3.2

hydrochloride (11).

3.3

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

3.4

Hydrofluoric acid ($\rho = 1.13\text{g/mL}$).

3.5

perchloric acid ($\rho = 1.67\text{g/mL}$).

Standard stock solution 3.6 MgO. Magnesium oxide ($w_{\text{MgO}} \geq 99.99\%$) pre-ignition 1h at 600°C , placed in a desiccator to cool to room temperature.

Weigh 0.5000g of magnesium oxide in 250mL beaker, add a small amount of wetting water, added 20mL of hydrochloric acid (3.2) is completely dissolved and transferred to 500mL Volumetric flask, dilute with water to volume, and mix. This solution 1mL 1mg containing magnesium oxide.

3.7

magnesium standard solution. Pipette 20.00mL magnesium accurate standard stock solution (3.6) in 100mL volumetric flask, was added 10mL Hydrochloric acid (3.2), dilute to the mark and mix. This solution 1mL containing $200\mu\text{g}$ magnesia.

3.8

strontium chloride solution. Weigh 30.43g strontium chloride ($\text{SrCl}_2 \cdot 6\text{H}_2\text{O}$) in 250mL beaker, add 30mL water, 25mL hydrochloric acid (3.2) was dissolved and transferred to 500mL volumetric flask, dilute with water to volume, and mix. This solution 1mL containing 20mg strontium.

3.9

Na₂EDTA solution [$c(\text{Na}_2\text{EDTA}) \sim 0.10\text{mol/L}$]. Weigh 18.62g Disodium ethylenediaminetetraacetate ($\text{C}_{10}\text{H}_{14}\text{N}_2\text{O}_8\text{Na}_2 \cdot 2\text{H}_2\text{O}$), placed in 250mL beaker, after adding hot water dissolved and transferred to 500mL volumetric flask, dilute with water to volume, and mix.

4 Instrument

Atomic absorption spectrometer, with a magnesium hollow cathode lamp.

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

used.

--- Characteristic concentration. measurement solution with the matrix solution consistent characteristic concentration (appropriately adjusted burners corner), magnesium oxide should not be Greater than 0.411 μ g/mL.

--- Precision. standard solution with the highest concentration of 11 times the absorbance measurements, the standard deviation should not exceed the average absorbance of 1.0%;