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

YS/T 990.16-2014

**Methods for chemical analysis of copper matte. Part 16:
Determination of mercury content. Cold atomic absorption
spectrometry**

冰铜化学分析方法 第16部分：汞量的测定冷原子吸收光谱法
(English Translation)

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Table of Contents

Foreword
1 Scope
2 Method summary
3 Reagents
4 Instrument
5 Sample

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 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;

--- 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 16 990.

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.

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1 Scope

This section YS/T 990 specifies the method for determination of the amount of mercury in matte.

This section applies to the determination of copper in ice amount of mercury. Determination of the range of 0.00010% to 0.010%.

2 Method summary

Samples with hydrochloric acid - nitric acid dissolution mixed with stannous chloride solution in reducing mercury ions to metallic mercury, in cold vapor atomic absorption the measurement of mercury vapor in absorbance at a wavelength of 253.7nm.

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 ($\rho = 1.19\text{g/mL}$), pure class distinctions.

3.2

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

3.3

mixed acid. nitric acid (3.1). hydrochloric acid (3.2). water = 1.3.4 volume mixing ratio.

3.4

potassium dichromate - nitric acid solution. Weigh 0.10g potassium dichromate, dissolved in water; adding 50mL of nitric acid (3.2), mix shifted 1000mL volumetric flask, dilute with water to volume, and mix.

3.5

potassium permanganate solution (50g/L).

3.6

hydroxylamine hydrochloride solution (100g/L).

3.7

stannous chloride solution (200g/L). Weigh 20g of stannous chloride ($\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$), was added 20mL of hydrochloric acid (3.1), dissolved by heating.

After cooling, transferred to 100mL volumetric flask, dilute with water to volume, and mix.

3.8

Storage mercury standard solution. Weigh 0.1354g advance through the dryer sufficiently dried mercury dichloride ($w_{\text{HgCl}_2} \geq 99.95\%$) in 100mL beaker, 5mL nitric acid (3.2) and a small amount of water, heat gently to dissolve and transferred to 1000mL volumetric flask, using potassium dichromate - nitrate Acid solution (3.4) diluted to the mark, and mix. This solution 1mL containing 100 μg mercury.

3.9

mercury standard solution A. Pipette 10.00mL mercury standard stock solution (3.8) in 100mL flask with potassium dichromate - nitric acid solution (3.4) diluted to the mark, and mix. This solution 1mL containing 10 μg mercury.

3.10

Mercury standard solution B. Pipette 2.00mL mercury standard solution A (3.9) in 200mL flask with potassium dichromate - nitric acid solution (3.4) diluted to the mark, and mix. This solution 1mL containing 0.1 μg of mercury (used when existing service).

4 Instrument

Cold vapor atomic absorption mercury analyzer.

5 Sample

5.1

Sample size should not exceed 100μm.