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

YS/T 990.10-2014

**Methods for chemical analysis of copper matte. Part 10: Determination
of silicon dioxide content. Molybdenum blue spectrophotometry and
potassium fluosilicate titrimetric method**

冰铜化学分析方法 第10部分：二氧化硅量的测定硅钼蓝分光光度法和氟硅酸钾滴
定法

(English Translation)

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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 10 990.

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 copper matte silica content.

This section applies to the determination of copper in ice silica content, method of measurement in the range of 0.50% to 2.00%; Tier 2 measurement range 2.00% - 22.00%.

2.1 Method summary

Sample molten potassium hydroxide, in weak acid solution, ammonium molybdate soluble silicic acid can be generated with yellow silicon molybdenum heteropoly acid, this can heteropolyacid Reduction by ferrous sulfate into silicon molybdenum blue, without the use of ammonium molybdate solution as reference, measure the absorbance in a spectrophotometer at a wavelength of 650nm to Working curve silica content.

2.2 Reagents

Unless otherwise indicated, used in the analysis confirmed only for the gifted class pure reagents and a water.

2.2.1

mixed flux. Two anhydrous sodium carbonate and a boric acid finely and mix.

2.2.2

potassium hydroxide.

2.2.3

ferrous ammonium sulfate.

2.2.4

oxalic acid.

2.2.5

ascorbic acid.

2.2.6

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

2.2.7

hydrochloric acid (11).

2.2.8

hydrochloric acid (16).

2.2.9

hydrochloride (892).

2.2.10

sulfuric acid ($\rho = 1.84\text{g/mL}$).

2.2.11

potassium hydroxide solution (200g/L).

2.2.12

ammonium molybdate solution (100g/L). Weigh 50g of ammonium molybdate was dissolved in 500mL boiling water, and mix.

2.2.13

reducing solution. the 12.5g ferrous ammonium sulfate (2.2.3), 16.2g of oxalic acid (2.2.4), 1g of ascorbic acid (2.2.5), 67.5mL sulfuric acid (2.2.10) was dissolved in 740mL of water,

and mix.

2.2.14

silica standard stock solution. Accurately weigh 0.1000g silica ($w_{\text{SiO}_2} \geq 99.99\%$) in a platinum crucible, add 5g Mixed flux (2.2.1), mix, then cover the surface 2g flux (2.2.1), capped at 900 °C ~ 950 °C muffle furnace melting 1h, remove the cold but later, placed polytetrafluoroethylene beaker, dissolved in water, the solution to be clarified later transferred to 1000mL volumetric flask, dilute to the mark with water, mix uniform. Transferred to a plastic bottle for storage. 1mL of this solution is a silica-containing 100 $\mu\text{g/mL}$.

2.2.15

phenolphthalein ethanol solution (10g/L). 1g phenolphthalein dissolved in 100mL of ethanol, and mix.