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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 5121.2-2008

Replacing GB/T 5121.2-1996; GB/T 13293.6-1991

**Methods for chemical analysis of copper and copper alloys --
Part 2: Determination of phosphorus content**

铜及铜合金化学分析方法 第2部分：磷含量的测定

(English Translation)

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Foreword

GB/T 5121 "Copper and copper alloy chemical analysis method" a total of 27 sections.

- Part 1. Determination of copper content;
- Part 2. Determination of phosphorus content;
- Part 3. Determination of lead content;
- Part 4. Carbon, Determination of sulfur content;
- Part 5. Determination of nickel content;
- Part 6. Determination of bismuth content;
- Part 7. Determination of arsenic content;
- Part 8. Determination of oxygen content;
- Part 9. Determination of iron content;
- Part 10. Determination of tin content;
- Part 11. Determination of zinc content;
- Part 12. Determination of antimony content;
- Part 13. Determination of aluminum content;
- Part 14. Determination of manganese content;
- Part 15. Determination of cobalt content;
- Part 16. Determination of chromium content;
- Part 17. Determination of beryllium content;

- Part 18. Determination of magnesium content;
- Part 19. Determination of silver content;
- Part 20. Determination of zirconium content;
- Part 21. Determination of titanium content;
- Part 22. Determination of cadmium content;
- Part 23. Determination of silicon content;
- Part 24. selenium, tellurium content was measured;
- Part 25. Determination of boron content;
- Part 26. Determination of mercury content;
- Part 27. Inductively coupled plasma atomic emission spectrometry.

This is Part 2.

This section includes a method, Method Two, Three methods Method IV. Phosphorus was recommended at 0.0002% ~ 0.0005% Arbitration Use Method Two, phosphorus content at 0.0005% to 0.50% recommended arbitration second method, Method three (bronze).

This section Method Four identical with ISO 4741. 1984 "Copper and copper alloys --- determining the amount of phosphorus vanadium molybdate spectrophotometry" Yuguo Compared to international standards, it made the following editorial changes.

- With a decimal point instead of a comma as the decimal point in the international standard " , " . " , " ;
- Use the "method" instead of "this International Standard";
- Revised international standard-Africa legal units of measurement;
- The formula, reg number, table number to re-annotate;
- Remove the cover of the international standards, directory, foreword and introduction.

This Part replaces GB/T 5121.2-1996 "Copper and copper alloys - Determination of phosphorus content", GB/T 13293.6-1991 "Methods for chemical analysis of high purity copper cathode phosphorus vanadium molybdenum heteropoly acid - crystal violet spectrophotometric determination of phosphorus content." this portion of the GB/T 5121.2-1996, GB/T 13293.6-1991 have the following main change compared to.

- One method of GB/T 13293.6-1991 amendment complements the quality assurance and control provisions, increasing the precision of the terms;
- Method two is "the first to spectrophotometric determination of phosphorus content - Molybdenum blue spectrophotometric method" of GB/T 5121.2-1996 the amendment,

supplement Charge of quality assurance and control provisions, increasing the precision of the terms;

--- Third, the method GB/T 5121.2-1996 in "The second method vanadium molybdenum yellow spectrophotometry phosphorus content" amendments Supplemented with quality assurance and control provisions, increasing the precision of the terms;

--- Increased Method four, identical with ISO 4741. 1984 "Copper and copper alloys --- determining the amount of phosphorus vanadium molybdate spectrophotometry." this part is proposed by the China Nonferrous Metals Industry Association.

The non-ferrous metal part by the National Standardization Technical Committee.

This section Chinalco Luoyang Copper Co., Ltd., Beijing General Research Institute of Mining and Metallurgy, China Nonferrous Metals Industry is responsible Institute of Standards Metrology and Quality Drafted.

A method in this section was drafted by Beijing General Research Institute of Mining and Metallurgy.

This method a part in drafting the Tongling Nonferrous Metals Institute, Beijing Nonferrous Metal Research Institute.

1.1 Scope

This method specifies the method for determination of copper and copper alloys phosphorus content.

This method is applicable to the determination of copper and copper alloys phosphorus content. Measurement range. 0.00005% 0.0005%.

1.2 Principle of the method

Sample with nitric acid - sulfuric acid mixture dissolved. Expulsion of nitrogen oxides to 1A/dm² ~ 2A/dm² current density electric lift copper in dilute Sulfuric acid medium, in the presence of polyvinyl alcohol, phosphorus vanadium molybdenum heteropoly acid and crystal violet red ionic association formed at a wavelength spectrophotometer Measured at 545nm absorption degree.

1.3 Reagents

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

1.3.1

nitric acid (1 + 1).

1.3.2

sulfate (0.5mol/L).

1.3.3

mixed acid. 5 per unit volume of nitric acid (ρ 1.42g/mL), 2 per unit volume of sulfuric acid (ρ 1.84g/mL) and 13 units of volume of water and mix.

1.3.4

potassium sulfate solution (100g/L).

1.3.5

reducing solution. Weigh 1g sodium bisulfite, 0.1g sodium thiosulfate, dissolved in 200mL of water, and mix.

1.3.6

molybdate - ammonium metavanadate mixture. A 26mL ammonium molybdate solution (40g/L) (BVIII) and 14mL ammonium metavanadate solution Diluted (2g/L) were mixed with water to 1000mL, stored in polyethylene plastic bottles.

1.3.7

polyvinyl alcohol solution (5g/L).

1.3.8

crystal violet solution (0.5g/L).

1.3.9

phosphorus standard stock solution. Weigh 0.4394g potassium dihydrogen phosphate (KH_2PO_4 , advance after 100 °C ~ 105 °C dried and placed in a dry it is cooled to room temperature), placed in 250mL beaker, dissolved in water. Moved into 1000mL volumetric flask, dilute with water to volume, and mix.

This solution 1mL containing 100 μ g phosphorus.

1.3.10

Phosphorus standard solution. Pipette 10.00mL phosphate standard solution reservoir solution (1.3.9) in 1000mL volumetric flask, dilute to the mark with water Degree, and mix. This solution 1mL containing 1 μ g phosphorus.

1.4 Instrument

1.4.1

Constant current electrolysis device, attached to a platinum mesh cathode, spiral platinum anode.