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

GB/T 13748.12-2013

Replacing GB/T 13748.12-2005

**Chemical analysis methods of magnesium and magnesium
alloys -- Part 12: Determination of copper content**

镁及镁合金化学分析方法 第12部分：铜含量的测定

(English Translation)

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Foreword

GB/T 13748 "analysis methods of magnesium and magnesium alloys" is divided into 22 parts.

- Part 1. Determination of aluminum content;
- Part 2. Determination of tin content pyrocatechol violet spectrophotometry;
- Part 3. Determination of lithium content Flame atomic absorption spectrometry;
- Part 4. Determination of manganese content periodate spectrophotometry;
- Part 5. Determination of yttrium content inductor coupled plasma atomic emission spectrometry;
- Part 6. Determination of silver by flame atomic absorption spectrometry;
- Part 7. Determination of zirconium content;
- Part 8. rare earth content Gravimetric method;
- Part 9. Determination of iron content phenanthroline spectrophotometry;
- Part 10. Determination of silicon content - Molybdenum blue spectrophotometric method;
- Part 11. Determination of beryllium content Eriochrome cyanine R spectrophotometry;
- Part 12. Determination of copper content;
- Part 13. Determination of lead content by flame atomic absorption spectrometry;
- Part 14. Determination of nickel dimethylglyoxime spectrophotometry;
- Part 15. Determination of zinc content;
- Part 16. Determination of calcium content by flame atomic absorption spectrometry;

- Part 17. potassium content and sodium content - Flame atomic absorption spectrometry;
- Part 18. Determination of the chlorine content of silver chloride turbidimetric method;
- Part 19. Determination of titanium content security for spectrophotometric morpholino than methane;
- Part 20. ICP-AES determination of element contents;
- Part 21. photoelectric direct reading atomic emission spectroscopy method element content;
- Part 22. Determination of thorium content.

The object is to have a standard adoption of Part 1, Part 4, Section 7, Section 8, Section 9, Section 10, Section 12, Part 9 Part 14 and Part 15 and other amendments.

This is Part 12.

This section is in accordance with GB/T 1.1-2009 given rules drafted.

This Part replaces GB/T 13748.12-2005 "analysis of magnesium and magnesium alloys Determination of copper neocuproine spectrophotometer Law degree. " this section compared with the GB/T 13748.12-2005, the main technical changes are as follows.

- Added "Method three. oxalyl dihydrazide spectrophotometry";
- The method I. Method II and Method Three "scope" merged into Chapter 1, "scope";
- Increased Chapter 2, "General" requirements;
- Increased Chapter 6, "lab report" requirement;
- Remove the "quality assurance and control" requirements;
- Increased the arbitration provisions.

This section includes three methods, "a method" is GB/T 13748.12-2005 "magnesium and magnesium alloys of copper content analysis methods Neocuproine spectrophotometry "in" a method "amendment;" Method II "is GB/T 13748.12-2005" of magnesium and magnesium alloys Determination of copper content analysis method Neocuproine spectrophotometry "in" "revision;" Method Method Two Three "use the translation method to modify the use of ISO 794. 1976 "magnesium and magnesium alloys Determination of copper oxalyl dihydrazide spectrophotometry" for ease of use, "Method III" made the following editorial modify.

- Delete the corresponding international standard "preface" and "Directory";
- According to China's national standards for the preparation of requirements, word processing.

Because this section only "Method III" is the international standard ISO standard adoption, so this part of ISO 794. 1976 conformance process Using a degree of modification.

Arbitration "a method" in this section of the copper content of 0.00030% to 0.200% of magnesium and magnesium alloys, "Method II" for the copper content at 2.00% to 4.00% of magnesium and magnesium alloys arbitration.

The non-ferrous metal part by the National Standardization Technical Committee (SAC/TC243) centralized.

This section is responsible for drafting units. Aluminum Corporation of China Zhengzhou Research Institute, China Nonferrous Metals Industry Quality Standards and Metrology Institute the study.

The method of the present section a drafting unit. Beijing Nonferrous Metal Research Institute.

This section Second method, Method three drafting unit. Aluminum Corporation of China Zhengzhou Research Institute.

1 Scope

This section provides magnesium and magnesium alloys Determination of copper content.

This section applies to the determination of magnesium and magnesium alloys of copper content. A method of measuring range. 0.00030% ~ 0.200%; Method two measuring range Wai. 2.00% - 4.00%; Method three measuring range. 0.0020% to 0.40%.

Method three in this section do not apply to magnesium alloys containing zirconium.

2 General

2.1

Unless otherwise indicated, this part of the reagents used are in line with national standards or industry standard analytical reagent, the water are distilled water.

2.2

specimens should be processed to a thickness of less than 1mm debris.

3.1 Method summary

Samples with hydrochloric acid, hydrogen peroxide dissolved with sodium citrate masking Fe (III), hydroxylamine hydrochloride copper (II) reduction to copper (I), adjusted Solution acidity to pH 5, with copper Neocuproine (2,9-dimethyl-1,10-phenanthroline) generated yellow complex, extracted with chloroform Take, for 460nm wavelength spectrophotometer measured absorbance.

3.2 Reagents

3.2.1

chloroform.

3.2.2

Hydrogen peroxide ($\rho = 1.10\text{g/mL}$), pure class distinctions.

3.2.3

hydrochloric acid (11), pure class distinctions.

3.2.4

hydroxylamine hydrochloride solution (100g/L), the time is now equipped with.

3.2.5

sodium citrate solution (300g/L).

3.2.6

Ammonia (11), pure class distinctions.

3.2.7

neocuproine (2,9-dimethyl-1,10-phenanthroline) ethanol (1g/L).

3.2.8

copper standard stock solution. Weigh 1.0000g copper [$w(\text{Cu}) \geq 99.9\%$] in 150mL beaker, 15mL nitric acid ($\rho = 1.40\text{g/mL}$) was dissolved, boiled to remove oxides of nitrogen, cooled and transferred to 1000mL volumetric flask, dilute with water to volume, and mix. this 1mL solution containing 1mg of copper.

3.2.9

Copper standard solution. Pipette 25.00mL copper standard stock solution (3.2.8) into 250mL volumetric flask, dilute to the mark with water, mix uniform. This solution 1mL containing 100 μg copper.

3.2.10

Copper standard solution. Pipette 25.00mL copper standard solution (3.2.9) into 250mL volumetric flask, dilute with water to volume, and mix.

This solution 1mL containing 10 μg copper.

3.2.11

Copper standard solution. Pipette 25.00mL copper standard solution (3.2.10) into 250mL volumetric flask, dilute to the mark with water, mix uniform. This solution 1mL containing 1 μg copper.