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

GB/T 3884.3-2025

Replacing GB/T 3884.3-2012

**Methods for chemical analysis of copper concentrates - Part 3:
Determination of sulfur content - Gravimetric method and
combustion-titration method**

铜精矿化学分析方法 第3部分：硫含量的测定 重量法和燃烧滴定法

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Standardization Administration of the PRC**

Table of Contents

- 1 Scope
- 2 Normative references
- 3 Terms and Definitions
- 4.3 Samples

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents". Drafting. This document is Part 3 of GB/T 3884, "Chemical Analysis Methods for Copper Concentrates". GB/T 3384 has already published the following parts.

- 1. Determination of Copper Content by Iodometric and Electrolytic Methods;
- 2. Determination of Gold and Silver Content by Flame Atomic Absorption Spectrometry and Fire Assay;
- 3. Determination of Sulfur Content by Gravimetric and Combustion Titration Methods;
- 4. Determination of Lead, Zinc, Cadmium, Nickel and Magnesium Oxide Content by Flame Atomic Absorption Spectrometry;
- 5. Determination of Fluorine Content using Ion-Selective Electrode Method;
- 7. Determination of Lead and Zinc Content by Na₂EDTA Titration;
- 9. Determination of Arsenic, Antimony and Bismuth Content;
- 11. Determination of Mercury Content by Cold Atomic Absorption Spectrometry;
- 12. Determination of Fluorine and Chlorine Content by Ion Chromatography and Potentiometric Titration;
- 15. Determination of total iron and iron(III) oxide content;
- 16. Determination of Silica Content by Potassium Fluorosilicate Titration and Gravimetric Method;
- 17. Determination of Alumina Content by Chromium Azure S Micellar Solubilization Spectrophotometric Method and Precipitation Separation - Fluoride Replacement - Na₂ EDTA titration;

1 Scope

GB/T 3884.3-2025 is the Chinese national standard covering sulfur in copper concentrate by two routes - the barium sulfate gravimetric method as the referee and the combustion-titration as the working method, with the decomposition, the interferences and the precision required of each. Sulfur is a penalty element in the smelter contract. Part 3 of the series. It replaces GB/T 3884.3-2012, in force from 1 May 2026. Issued on 31 October 2025, it has been in force since 1 May 2026, replacing GB/T 3884.3-2012.

4.1 Principle The sample was uniformly mixed with anhydrous sodium carbonate-zinc oxide sintering agent and calcined at 780°C–800°C. The semi-molten material was then dissolved and leached with hot water. Barium chloride is used to precipitate sulfate ions in the solution. The precipitate is filtered, washed, ignited, and weighed. The sulfur content of the sample is calculated based on the mass of barium sulfate.

4.2 Reagents Unless otherwise specified, only reagents confirmed to be of analytical purity or higher shall be used in the analysis.

4.2.1 Water, GB/T 6682, Grade III and above.

4.2.2 Sintering agent. Mix 1 part anhydrous sodium carbonate with 1 part zinc oxide, grind finely and mix evenly.

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

4.2.4 Barium chloride solution (100g/L), used after filtration.

4.2.5 Silver nitrate solution (10 g/L). Weigh 1 g of silver nitrate, dissolve it in a small amount of water, and dilute with water to 100 mL. Mix well. For every 100 mL of silver nitrate solution... Add 3 to 4 drops of nitric acid ($\rho =$

1.42 g/mL) to the silver acid solution.

4.2.6 Methyl orange indicator (1 g/L).

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 6682 Specifications and test methods for water used in analytical laboratories

3 Terms and Definitions

This document does not contain any terms or definitions that need to be defined.

4.3 Samples

4.3.1 The particle size of the sample should not exceed 100 μm .

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