

ICS 77.120.30

CCS H 13



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

GB/T 3884.15-2025

Replacing GB/T 3884.15-2014

**Methods for chemical analysis of copper concentrate - Part 15:
Determination of total iron and ferriferrous oxide contents**

铜精矿化学分析方法 第15部分：总铁和四氧化三铁含量的测定

Issued on: August 29, 2025

Implemented on: March 1, 2026

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

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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 15 of GB/T 3884, "Chemical Analysis Methods for Copper Concentrates". GB/T 3884 has the following parts published.

- Part 1: Determination of Copper Content by Iodometric and Electrolytic Methods;
- Part 2: Determination of Gold and Silver Content by Flame Atomic Absorption Spectrometry and Fire Assay;
- Part 3: Determination of Sulfur Content by Gravimetric and Combustion Titration Methods;
- Part 4: Determination of Lead, Zinc, Cadmium, Nickel and Magnesium Oxide Content by Flame Atomic Absorption Spectrometry;
- Part 5: Determination of Fluorine Content using Ion-Selective Electrode Method;
- Part 7: Determination of Lead and Zinc Content by Na₂EDTA Titration;
- Part 9: Determination of Arsenic, Antimony and Bismuth Content;
- Part 11: Determination of Mercury Content by Cold Atomic Absorption Spectrometry;
- Part 12: Determination of Fluorine and Chlorine Content by Ion Chromatography and Potentiometric Titration;
- Part 15: Determination of total iron and iron(III) oxide content;
- Part 16: Determination of Silica Content by Potassium Fluorosilicate Titration and Gravimetric Method;

- Part 17.Determination of Alumina Content by Chromium Azure S Micellar Solubilization Spectrophotometric Method and Precipitation Separation - Fluoride Replacement-Na₂EDTA titration method;

- Part 18.Determination of the content of arsenic, antimony, bismuth, lead, zinc, nickel, cadmium, cobalt, chromium, aluminum oxide, magnesium oxide, and calcium oxide, including inductive coupling, etc.

Particle atomic emission spectrometry;

- Part 19.Determination of Thallium Content by Inductively Coupled Plasma Mass Spectrometry;

- Part 20.Determination of Mercury Content - Direct Method with Solid Injection;

- Part 21.Determination of the content of copper, sulfur, lead, zinc, iron, aluminum, calcium, magnesium and manganese by wavelength dispersive X-ray fluorescence spectrometry.

This document replaces GB/T 3884.15-2014 "Chemical Analysis Methods for Copper Concentrates - Part 15.Determination of Iron Content - Potassium Dichromate Titration".

Compared with GB/T 3884.15-2014, the main technical changes in the "Law" are as follows, apart from structural adjustments and editorial modifications.

a) The scope has been changed; the applicable object has been changed from "copper concentrate" to "copper concentrate and copper slag concentrate," and the original text "This document applies to iron in copper concentrate" has been changed to "[]".

The statement "The content determination range is 8.00%~40.00%" is revised to "This document applies to the determination of total iron and... in copper concentrate and copper slag concentrate." For the determination of ferric oxide, the total iron determination range is 8.00%~42.00%; the ferric oxide determination range is 0.10%~ 5.0% (see Chapter 1, Chapter 1 of the 2015 edition);

b) A step has been added to the total iron determination process to eliminate interference from arsenic and antimony using hydrobromic acid (see 4.5.4.1);

c) The method for the blank test in the determination of total iron has been changed (see 4.5.4.3, 5.3 in the 2015 version);

d) The sample dissolution and determination methods for residues in the total iron determination have been modified (see 4.5.4.5~4.5.4.7, 5.4.3 in the 2015 edition);

e) The precision data for the determination of total iron have been revised (see 4.7, Chapter 7 of the 2015 edition);

f) The content on the determination of iron tetroxide in copper concentrate by magnetic material analysis has been added (see Chapter 5).

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Nonferrous Metals Industry Association.

This document is under the jurisdiction of the National Technical Committee on Standardization of Nonferrous Metals (SAC/TC243).

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This document was first published in 2014, and this is its first revision.

Introduction

Copper concentrate and copper slag concentrate are raw materials for copper smelting. Standards for chemical composition analysis methods of copper concentrate play a crucial role in the non-ferrous metals industry's standard system.

This series of methods plays a vital role in the production, trade, and application of copper concentrate, providing technical support for the high-quality development of China's non-ferrous metals industry.

The purpose of GB/T 3884, "Chemical Analysis Methods for Copper Concentrates," is to

describe the composition of different chemical elements such as copper, gold, silver, lead, and zinc in copper concentrates.

Determination methods. With the continuous increase in copper demand, the copper concentrate trade is also constantly growing, indicating a very promising future for the copper industry. To meet...

The industry's demand for copper concentrate and copper slag concentrate production, trade, and resource recycling necessitates improved reliability and comparability of testing results, and faster processing.

Accurate determination of the content of various elements in copper concentrate and copper slag concentrate is of great significance; based on extensive research into enterprise needs, [the following is discussed/conducted].

GB/T 3884 "Chemical Analysis Methods for Copper Concentrates" (21 parts in total) has been integrated and revised.

The integrated GB/T 3884 "Chemical Analysis Methods for Copper Concentrates" is proposed to consist of 15 parts.

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