

ICS 77.120.10

CCS H12



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

GB/T 14849.8-2015

**Methods for chemical analysis of silicon metal - Part 8:
Determination of copper content - Atomic absorption
spectrometric method**

工业硅化学分析方法 第8部分：铜含量的测定 原子吸收光谱法

Issued on: September 11, 2015

Implemented on: August 1, 2016

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China;
Standardization Administration of China**

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Foreword

GB/T 14849 "Industrial silicon chemical analysis method" is divided into 11 parts. - Part 1. Determination of iron content - 1,10 - phenanthroline spectrophotometric method; - Part 2. Determination of aluminum content - Chromazurol - spectrophotometric method; - Part 3. Determination of calcium content - Flame atomic absorption spectrometric method, Chlorophosphonazo I spectrophotometric method; - Part 4. Determination of impurity element content - Inductively coupled plasma atomic emission spectrometry; - Part 5. Determination of impurity element content - X - ray fluorescence spectroscopy; - Part 6. Determination of carbon content - Infrared absorption method; - Part 7. Determination of phosphorus content - Phosphorolybdenum blue spectrophotometric method; - Part 8. Determination of copper content - Atomic absorption spectroscopy; - Part 9. Titanium content determination of diantipyrylmethane spectrophotometric method; - Part 10. Determination of mercury content - Hydride generation - atomic fluorescence spectrometry; - Part 11. Determination of hexavalent chromium content - Diphenylcarbazide spectrophotometric method. This part is part 8 of GB/T 14849. This part is drafted in accordance with the rules given in GB/T 1.1-2009. This part is made by China Nonferrous Metals Industry Association. This part is the national nonferrous Metals Standardization Technical Committee (SAC/TC243). This part is responsible for drafting unit. Kunming Metallurgical Research Institute. This part participates in the drafting unit. Kunming Metallurgical New Material Co., Ltd., Yunnan Entry-Exit Inspection and Quarantine Bureau, Tongzhou Standard Technology Service Co., Ltd., China Aluminum Industry Co., Ltd. Zhengzhou Institute, Yunnan Yongchang Silicon Industry Co., Ltd. The main drafters of this part. Zhao Deping, Liu Weili, Zhao Jianwei, Yang Yi, Wang Renxiang, Hu Zhitao, An Zhongqing, Kang Ruogu, Cheng Shuqiang, Wang Honglei, Kuang Yuyun, Chen Wenshu, Liu Yingbo, Tan Guojian, Wang Yunzhou, Zhang Yunhui, Hu Xuan, Wu Yuqiang, Zhou Ya, Tang Fei. Chemical silicon chemical analysis method Part 8. determination of copper content Atomic Absorption Spectrometry Safety precautions. Some of the reagents used in this study are corrosive and should be handled with care. Water rinse, severe should be treated immediately.

1 Scope

GB/T 14849.8-2015 is the Chinese national standard on methods for chemical analysis of silicon metal - part 8: determination of copper content - atomic absorption spectrometric method, in the field of metallurgy. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 11 September 2015 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 August 2016. Classification: ICS 77.120.10, CCS H12. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This part of GB/T 14849 specifies the determination of copper content in industrial silicon. This part is applicable to the determination of copper content in industrial silicon, the determination range (mass fraction). 0.0010% ~ 0.50%.

2 Normative reference documents

The following documents are indispensable for the application of this document. For dated references, only the dated edition applies to this article Pieces. For undated references, the latest edition (including all modifications) applies to this document.

GB/T 6682 Analytical laboratory water specifications and test methods Representation and Judgment of Numerical Correction Rule and Limit Value of GB/T 8170

3 Method summary

The samples were dissolved in hydrofluoric acid and nitric acid, and the chloric acid was added to the flue gas to remove silicon, fluorine and the like. In the nitric acid medium, at the wavelength of 324.7nm, The absorbance of copper was measured using an air-acetylene flame.

4 Reagent

Unless otherwise stated, only the confirmed analytical reagent is used in the analysis; the water used is distilled or deionized or substantially pure water, Shall comply with the provisions of GB/T 6682.

4.1 nitric acid (ρ 1.42g/mL).

4.2 hydrofluoric acid (ρ 1.15g/mL).

4.3 perchloric acid ($\rho=1.67\text{g/mL}$).

4.4 nitric acid (1:1).

4.5 Copper Standard Storage Solution.

1.000 g of metallic copper ($\geq 99.995\%$) was placed in a 250 mL beaker, 40 mL of nitric acid (4.4) Cover the surface dish and heat it until it is completely dissolved. Boil to remove nitrogen oxides, wash the dishes and cup walls with water, and cool to room temperature. Transferred into 1000mL volumetric flask, diluted with water to the mark, mix. 1 mL of this solution contains 1 mg of copper.

4.6 copper standard solution. remove 5.00mL copper standard storage solution (4.5) placed in 100mL volumetric flask, add 10mL nitric acid (4.4), Diluted with water to the mark, mix, this solution 1mL containing $50\mu\text{g}$ copper.

5 Instruments

5.1 Analysis of the balance. accurate to 0.0001g.