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

GB/T 14849.10-2016

**Methods for chemical analysis of silicon metal - Part 10:
Determination of mercury content - Atomic fluorescence
spectrometry method**

工业硅化学分析方法 第10部分：汞含量的测定 原子荧光光谱法

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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; - 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. Determination of titanium content - Diantipyrilmethane spectrophotometric method; - Part 10. Determination of mercury content - Atomic fluorescence spectrometry; - Part 11. Determination of chromium content - Diphenylcarbazide spectrophotometric method. This part is part 10 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 the drafting unit. Kunming Metallurgical Research Institute, Beijing Nonferrous Metals Research Institute, Beijing Mining and Metallurgy Research Institute. This part participates in the drafting unit. Yunnan Yongchang Silicon Industry Co., Ltd., SGS Standard Service (Tianjin) Co., Ltd., Yunnan Xiangyun Dragon Recycling Technology Co., Ltd., Yunnan Entry-Exit Inspection and Quarantine Bureau, Guangzhou Nonferrous Metals Research Institute. This part of the main drafters. Liu Yingbo, Luo Shun, Yang Yi, Chen Diangeng, Wang Li, Tang Fei, Yang Chen, Duan Kunyan, Teng Yajun, Zhou Jie, ZHAO De-ping, LIU Wei-li, CHEN Ying-chun, QUI Li-jun, CHENG Pei-qiang, MA Li-bi Chemical silicon chemical analysis method Part 10. determination of mercury content Atomic fluorescence spectrometry

1 Scope

GB/T 14849.10-2016 is the Chinese national standard on methods for chemical analysis of silicon metal - part 10: determination of mercury content - atomic fluorescence spectrometry 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 29 August 2016 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 July 2017. 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 mercury content in industrial silicon. This part is applicable to the determination of mercury in industrial silicon, the determination range. 0.000010% ~ 0.0010%.

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 The Representation and Judgment of the Rule and Limit Value of GB/T 8170 Numbers

3 Method summary

The sample was dissolved in nitric acid and hydrofluoric acid, and the mercury ions were reduced to the atomic vapor of mercury by potassium borohydride in the nitric acid medium. In the furnace atomizer, the fluorescence intensity of mercury was measured on an atomic fluorescence spectrometer, and the matrix calibration method was used to determine the fluorescence intensity.

4 Reagent

Unless otherwise stated, the reagents used in this section are excellent pure reagents that meet national or industry standards. GB/T 6682 provides a level of water.

4.1 Silica powder ($\geq 99.99\%$).

4.2 Mercury chloride ($\geq 99.95\%$).

4.3 hydrofluoric acid ($\rho 1.19\text{g/mL}$).

4.4 nitric acid ($\rho 1.42\text{g/mL}$).

4.5 nitric acid (5 95).

4.6 potassium borohydride solution (2g/L). Weigh 0.20g potassium hydroxide, dissolved in

about 50mL of water, add 0.20g potassium borohydride and make it dissolved Solution, diluted with water to 100mL, shake, with the time with the distribution.

4.7 potassium dichromate solution (0.5g/L). Weigh 1.0g potassium dichromate, dissolve in about 100mL water, add 100mL nitric acid (4.4), water Diluted to.2000mL, shake.

4.8 potassium dichromate solution (50g/L). Weigh 10.0g potassium dichromate, dissolved in 100mL water, diluted with water to.200mL, shake.

4.9 Mercury Standard Storage Solution A. Accurately weigh 0.1354g Mercury Chloride (4.2) previously dried by a silica gel dryer, dissolved in dichromic acid Potassium solution (4.7) solution, and into the 1000mL volumetric flask, with potassium dichromate solution (4.7) solution diluted to the mark, shake. This solution 100 μ g of mercury per milliliter.

4.10 Mercury Standard Storage Solution B. Remove 1 mL of Mercury Standard Storage Solution A (4.9) In a 100 mL volumetric flask, mix with potassium dichromate solution