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

GB/T 47081-2026

**Determination of iron, aluminium and calcium in silicon nitride
powder - Inductively coupled plasma atomic emission
spectrometry**

氮化硅粉体中铁、铝、钙含量的测定 电感耦合等离子体发射光谱法

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Table of Contents

- 1 Scope
- 2 Normative references
- 3 Terms and Definitions
- 5 Reagents and Materials
- 6 Instruments and Equipment

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. 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 prepared by the National Technical Committee on Standardization of Semiconductor Equipment and Materials (SAC/TC203) and the National Semiconductor Equipment and Materials Standards Committee. It was jointly proposed and is under the jurisdiction of the Materials Subcommittee of the Chemical Technology Committee (SAC/TC203/SC2). This document was drafted by: Xinjiang Xinte New Energy Materials Testing Center Co., Ltd., Sichuan Yongxiang New Energy Co., Ltd., and Shandong Zhonglin Semiconductor. Tixin New Materials Co., Ltd., Luoyang Zhonggui High-Tech Co., Ltd., Jiangsu Zhongneng Silicon Industry Technology Development Co., Ltd., Jiangsu Xinhua Semiconductor Technology Co., Ltd. Joint-stock company, Qinghai Nanbo New Energy Technology Co., Ltd., National Standard (Beijing) Inspection and Certification Co., Ltd., Gaofu High-Tech Materials (Zhejiang) Limited Liability Company, Songshan Lake Materials Laboratory. The main drafters of this document are. Qiu Yanmei, Liu Guoxia, Li Bingqing, Li Lanlan, Jia Lin, Li Jinchun, Liu Hongliang, Cao Junying, and Wang Chunming. Zhao Peizhi, Li Qiang, Chen Caixia, Zhong Haiyan, Hu Wei. Determination of iron, aluminum and calcium content in silicon nitride powder Inductively Coupled Plasma Emission Spectroscopy

1 Scope

GB/T 47081-2026 is the Chinese national standard covering metallic impurities in silicon nitride powder - iron, aluminium and calcium form glassy phases at the grain boundaries during sintering and take away exactly the high-temperature strength the ceramic was chosen for. First edition. It was issued on 28 January 2026 and has been in force since 1 August 2026, as a first edition. The document is under the responsibility of the

Standardization Administration of China. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document describes an inductively coupled plasma atomic emission spectrometry method for determining the iron, aluminum, and calcium content in silicon nitride powder. This document applies to the determination of iron, aluminum, and calcium content in silicon nitride powder, with a determination range of

0.001 mg/g to

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 8170 Rules for rounding off numerical values and the representation and determination of limiting values

GB/T 11446.1-2013 Electronic Grade Water

GB/T 14666 Analytical Chemistry Terminology

3 Terms and Definitions

The terms and definitions defined in GB/T 14666 apply to this document.

4. Method Principles The silicon nitride powder sample was digested in a microwave digester using hydrofluoric acid and nitric acid. Silicon and fluorine were removed by heating on a hot plate, and the powder was dissolved in nitric acid. Residue. The analytical solution is introduced into an inductively coupled plasma optical emission spectrometer, and under the selected optimal determination conditions, the components in the analytical solution are measured. The content of elements.

5 Reagents and Materials

5.1 Water. EW-III grade water or water of equivalent purity as specified in GB/T 11446.1-2013.

5.2 Hydrofluoric acid ($\rho=1.15\text{g/cm}^3$). The content of each element to be tested is not greater than $10\mu\text{g/L}$.

5.3 Nitric acid ($\rho=1.41\text{g/cm}^3$). The content of each element to be tested is not greater

than 10µg/L.

5.4 Mixed element standard stock solutions. Certified standard stock solutions or prepared standard stock solutions, with the mass concentration of each analyte being 1000 µg/mL.

5.5 Mixed element standard solution. Transfer 10 mL of the mixed element standard stock solution (5.4) into a 100 mL volumetric flask and dilute with water to the mark. Shake well. 1 mL of this solution contains 100 µg of each of the elements to be tested.

6 Instruments and Equipment

6.1 Inductively Coupled Plasma Emission Spectrometer. Equipped with a hydrofluoric acid resistant system.