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

GB/T 10267.2-2025

Replacing GB/T 10267.2-1988

**Methods for analysis of calcium metal - Part 2: Determination of
micro-amounts of silicon by spectrophotometry**

金属钙分析方法 第2部分：光度法测定微量硅

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part

1. Structure and drafting rules for standardization documents" Drafting. This document is Part 2 of GB/T 10267 "Analysis of Metallic Calcium". GB/T 10267 has been published in the following parts.

1. Determination of chlorine by chloride ion selective electrode method;
2. Photometric determination of trace silicon;
3. Direct determination of iron, nickel, copper, manganese and magnesium by atomic absorption spectrophotometry;
4. Spectrophotometric determination of aluminum using 8-hydroxyquinoline-chloroform extraction;
5. Determination of nitrogen using the distillation-Nessler reagent photometric method. This document replaces GB/T 10267.2-1988 "Analysis of metallic calcium - Photometric

determination of trace amounts of silicon" and GB/T 10267.2- Compared with 1988, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

- a) The description of the relevant content in "Scope" has been changed (see Chapter 1, Chapter 1 of the 1988 edition);
- b) Added relevant content of standard substances/standard samples in "reagents or materials" (see 5.14);
- c) Added the requirements for sample status in "Sample" (see 7.1);
- d) The limitation of the "sand bath" heating method in the "blank test" has been changed (see 8.2, 5.2.2 of the 1988 edition);
- e) The calculation formula in "Test Data Processing" has been changed (see Chapter 9, Chapter 6 of the 1988 edition);
- f) The description of the relevant content in "Precision" has been changed (see Chapter 10, Chapter 7 of the 1988 edition);

1 Scope

GB/T 10267.2-2025 is the Chinese national standard on methods for analysis of calcium metal - part 2: determination of micro-amounts of silicon by spectrophotometry, 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 1 August 2025 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 February 2026. Classification: ICS 77.120, CCS H 12. 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 document describes the analytical method for the photometric determination of silicon content in metallic calcium, including reagents or materials, instruments and equipment, samples, test steps, procedures, test data processing, precision, quality assurance and control, and test reporting. This document is applicable to the determination of silicon content in metallic calcium. Measurement range. 10µg/g~320µg/g.

2 Normative references

This document has no normative references.

3 Terms and Definitions

There are no terms or definitions that require definition in this document.

4 Principles

The sample is dissolved in hydrochloric acid solution. Under certain concentration of hydrochloric acid, ammonium molybdate reacts with silicon in metallic calcium to form silicon molybdenum yellow, which increases the salt content in the solution. The concentration of acid was adjusted to eliminate the interference of phosphorus, and molybdenum yellow was reduced to molybdenum blue with ascorbic acid. Its absorbance was measured at 650nm. The silicon content in the sample was obtained from the curve.

5 Reagents or materials

Unless otherwise specified, the water used for analysis was deionized water with a conductivity of $\leq$

0.10 mS/m (25°C).

5.1 Hydrochloric acid. analytical grade, $\rho(\text{HCl}) =$

5.2 Ammonium molybdate. analytical grade.

5.3 Ascorbic acid. analytical grade.

5.4 Calcium carbonate. spectrally pure.

5.5 Silicon dioxide. spectrally pure, calcined at 750°C-850°C for 2 h before use and cooled to room temperature in a desiccator.

5.6 Ammonia. Premium grade ammonia needs to be purified before use.

5.7 Anhydrous sodium carbonate. standard reagent.

5.8 p-Nitrophenol. analytical grade.

5.9 Hydrochloric acid solution. $\phi(\text{HCl}) = 50\%$, prepared by mixing (5.1) with water.

5.10 Ammonium molybdate solution. $\rho[(\text{NH}_4)_6\text{MO}_7\text{O}_{24} \cdot 4\text{H}_2\text{O}] = 50 \text{ g/L}$. Weigh

5.0 g of ammonium molybdate (5.2) into a beaker, dissolve it in water and dilute it to 100 mL. Store it in a plastic bottle and filter it if necessary.

5.11 Ascorbic acid solution. $\rho(\text{C}_6\text{H}_8\text{O}_6) = 10 \text{ g/L}$. Weigh

1.0 g of ascorbic acid (5.3) into a beaker, dissolve it in water and dilute to 100 mL, mix well, and prepare it before use.

5.12 Matrix calcium solution. $\rho(\text{Ca}) =$

0.05 g/mL. Weigh

12.51 g of calcium carbonate (5.4) into a plastic beaker, add 20 mL of water, and slowly add 25 mL of hydrochloric acid solution (5.1) in several times.

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