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

**GB/T 10267.3-2008**

Replacing GB/T 10267.3-1988

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**Method for analysis of calcium metal - Part 3: Direct determination of  
iron, nickel, copper, manganese and magnesium in calcium metal by  
atomic absorption spectrophotometry**

金属钙分析方法 第3部分：原子吸收分光光度法直接测定铁、镍、铜、锰、镁

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Standardization Administration of China**

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### Foreword

GB/T 10267 "Method for analysis of calcium metal" is divided into five parts.

- Part 1. Determination of chlorine chloride ion selective electrode method;
- Part 2. Spectrophotometric determination of trace amounts of silicon;
- Part 3. Direct determination by atomic absorption spectrophotometry of iron, nickel, copper, manganese, magnesium;
- Part 4. 8-quinolinol - chloroform extraction spectrophotometric determination of aluminum;
- Part 5. Distillation - Nessler reagent spectrophotometric determination of nitrogen. This section GB/T Part of 310,267. This Part replaces GB/T 10267.3-1988 "calcium metal analysis by atomic absorption spectrometry direct determination of iron, nickel, copper, manganese, magnesium." This section compared with the GB/T 10267.3-1988, the main differences are as follows:
  - Increasing the normative references;
  - Like the hydrochloric acid solution of nitric acid to dissolve the sample;
  - The self-made standard stock solution to a standard solution;
  - Adjust the measurement range;
  - Adjust the concentration of the standard solution and the sample solution. This part is proposed by the China National Nuclear Corporation. This part of the National Nuclear Energy Standardization Technical Committee (SAC/TC58) centralized. This section was drafted by: China North Nuclear Fuel Limited. The main drafters of this section. Helen Feng, Li Aijun, Zhao Haisheng, late new country. This part of the standard replaces the previous editions are.
- GB/T 10267.3-1988. Calcium metal analysis Part 3. Direct determination by atomic absorption spectrophotometry Iron, nickel, copper, manganese, magnesium

## 1 Scope

GB/T 10267.3-2008 is the Chinese national standard on method for analysis of calcium metal - part 3: direct determination of iron, nickel, copper, manganese and magnesium in calcium metal by atomic absorption 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 2 July 2008 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 April 2009. Classification: ICS 77.120.70, 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.

GB/T 10267 provisions of this part of the metal calcium, iron, nickel, copper, manganese, magnesium determination. This section applies to iron, nickel, copper, manganese, magnesium measured prepared by electrolysis of distilled calcium metal. Detection limit. iron 20µg/g; Nickel 20µg/g; copper 10µg/g; magnesium 20µg/g; Mn 10µg/g.

## 2 Normative references

The following documents contain provisions which, through reference

GB/T 10267 in this section, constitute provisions of this part. For dated reference documents Member, all subsequent amendments (not including errata content) or revisions do not apply to this section, however, encouraged to reach under this section Parties to research agreement to use the latest versions of these documents. For undated reference documents, the latest versions apply to this section.

GB/T 4864 calcium metal and its products Principle

3 Calcium metal sample is dissolved in nitric acid, and diluted appropriately in accordance with the content of the analyte under selected conditions, the use of background correction and groups Matching method with atomic absorption spectrophotometer measured directly measured elements. Product 2 times the upper limit of the concentration of coexisting elements do not affect Determination.

## 4 Reagents

Unless otherwise indicated, the method of water are deionized water, the reagents were of analytical grade reagents. Calcium oxide

4.1 Reference. 99.99%. Nitric acid 4.2. 1 + 1, with a superior grade of pure nitric acid ( $\rho =$

1.42g/mL) and water formulated.

4.3 iron standard solution.  $\rho(\text{Fe}) = 1000\mu\text{g/mL}$ , 2%  $\text{HNO}_3$  medium, commercially available.

4.4 Nickel standard solution.  $\rho(\text{Ni}) = 1000\mu\text{g/mL}$ , 2%  $\text{HNO}_3$  medium, commercially available.

4.5 Copper standard solution.  $\rho(\text{Cu}) = 1000\mu\text{g/mL}$ , 2%  $\text{HNO}_3$  medium, commercially available.

4.6 Manganese standard solution.  $\rho(\text{Mn}) = 1000\mu\text{g/mL}$ , 2%  $\text{HNO}_3$  medium, commercially available.

4.7 Magnesium standard solution.  $\rho(\text{Mg}) = 1000\mu\text{g/mL}$ , 2%  $\text{HNO}_3$  medium, commercially available.

4.8 iron, nickel, copper, manganese mixed standard solution. each standard solution were taken 4.3, 4.4, 4.5, 4.6 1.00mL, placed in 100mL capacity Bottle, add 2mL nitric acid (4.2), dilute to the mark and mix, spare, this solution iron, nickel, copper, manganese concentration of  $10\mu\text{g/mL}$ .

4.9 Magnesium standard solution.  $\rho(\text{Mg}) = 4\mu\text{g/mL}$ . Take 10.00mL magnesium standard solution (4.7), placed in 100mL volumetric flask, add 2mL nitric acid (4.2), dilute to the mark and mix dubbed  $100\mu\text{g/mL}$  of solution, then take 2mL  $100\mu\text{g/mL}$  solution in 50mL Flask, add 1mL of nitric acid (4.2), dilute to the mark and mix and set aside.

4.10 calcium base solution.  $\rho(\text{Ca}) = 100\text{mg/mL}$ . Weigh 14.00g baseline calcium oxide (4.1) in 200mL beaker, 10mL of nitric acid (3.2) was dissolved into 100mL volumetric flask, add 2mL nitric acid (4.2), dilute to the mark and mix.

4.11 calcium base solution.  $\rho(\text{Ca}) = 20\text{mg/mL}$ . Calcium-based precursor solution of 10mL (4.10) in 50mL volumetric flask, add 1mL nitrate Acid (4.2), dilute to the mark and mix.