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**YS**

**NONFERROUS METALS INDUSTRY STANDARD OF THE  
PEOPLE'S REPUBLIC OF CHINA**

**YS/T 226.5-2009**

Replacing YS/T 226.7-1994

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**Methods for chemical analysis of selenium. Part 5:  
Determination of silicon content. Molybdenum blue  
spectrophotometry method**

硒化学分析方法 第5部分：硅量的测定硅钼蓝分光光度法  
(English Translation)

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### Foreword

YS/T 226 "selenium chemical analysis method" is divided into 13 parts.

- Part 1. Determination of bismuth content - Hydride Generation - Atomic Fluorescence Spectrometry
- Part 2. Determination of antimony content Hydride Generation - Atomic Fluorescence Spectrometry
- Part 3. Determination of aluminum content Chromazurol S- cetylpyridinium bromide spectrophotometric method
- Part 4. Determination of mercury content of dithizone - CTC colorimetric titration
- Part 5. Determination of the amount of silicon molybdenum blue spectrophotometry
- Part 6. Determination of sulfur content symmetrical diphenyl semicarbazide spectrophotometry
- Part 7. Determination of magnesium content - Flame atomic absorption spectrometry
- Part 8. Determination of copper content - Flame atomic absorption spectrometry
- Part 9. Determination of iron content by flame atomic absorption spectrometry
- Part 10. Determination of nickel content by flame atomic absorption spectrometry
- Part 11. Determination of lead content by flame atomic absorption spectrometry
- Part 12. Determination of the amount of selenium sodium thiosulfate volumetric method
- Part 13. silver, aluminum, arsenic, boron, mercury, bismuth, copper, cadmium, iron, gallium, indium, magnesium, nickel, lead, silicon, antimony, tin, tellurium, titanium, zinc contents Inductively Coupled Plasma Mass Spectrometry this section YS/T Part 5 226.

The partial replacement of YS/T 226.7-1994 "selenium determination of silicon content of silicon molybdenum blue spectrophotometric method." And YS/T 226.7-1994 Compared to the main section has the following changes.

--- Supplementary terms of quality assurance and control;

--- Increase the repeatability limit, will be allowed to poor reproducibility limit.

The non-ferrous metal part by the National Standardization Technical Committee and centralized.

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## 1 Scope

This section YS/T 226 specifies the method for determination of selenium in silicon content.

This section applies to the determination of selenium in silicon content. Measurement range. 0.0002% to 0.0020%.

## 2 Method summary

The sample is dissolved in nitric acid, selenium dioxide formed volatiles were removed insoluble silica is added to make it into hydrofluoric acid soluble. Silicon and molybdic acid Ammonium pH1.1 ~ pH1.5 generate heteropolyoxomolybdate extracted with n-amyl alcohol, organic phase hydrazine sulfate, tin dichloride reduced to silicon molybdenum blue, to wave Length at 720nm measured absorbance.

Excess fluoride and boric acid to form a stable boron tetrafluoride anions does not interfere with the determination of silicon.

The presence of tartaric acid, 40 $\mu$ g arsenic, phosphorus and selenium do not interfere with the rest of the determination of silicon.

## 3 Reagents

The standard water is deionized water, conductivity is not more than  $6.67 \times 10^{-2} \mu\text{S} \cdot \text{cm}^{-1}$ .

Nitrate 3.1 (rho1.42g/mL).

### 3.2

sulfate (rho1.84g/mL).

**3.3**

nitric acid (1 + 1).

**3.4**

sulfate (1 + 1).

**3.5**

Hydrofluoric acid. hydrofluoric acid (excellent pure) platinum by distillation was purified by distillation or polytetrafluoroethylene sub-boiling distillation purified by distillation.

**3.6**

boric acid solution, especially pure, saturated solution.

**3.7**

ammonium molybdate solution (100g/L), high purity.

**3.8**

tartaric acid solution (100g/L), pure class distinctions.

**3.9**

stannous chloride solution (100g/L), washed with hydrochloric acid (1 + 1) are prepared (freshly prepared).

**3.10**

hydrazine sulfate solution (2.5g/L), with 0.25mol/L sulfuric acid formulation.

**3.11**

n-amyl alcohol, AR.

Silicon 3.12 Standard stock solution. Weigh 0.2142g silica (silica mass fraction of  $\geq 99.99\%$ ) placed in a platinum crucible, add 5g of sodium carbonate into the mix, capped at 900 °C muffle furnace melting 1h, remove the cooled and transferred to a polyethylene cup, add cold water to dissolve, moved 1000mL volumetric flask, dilute with water to volume, and mix immediately moved polyethylene bottle. This solution 1mL containing 100 $\mu$ g silicon.

**3.13**

Silicon standard solution. Pipette 50.0mL silicon standard stock solution (3.12) into 1000mL volumetric flask, dilute to the mark, Mix immediately transferred to a polyethylene bottle. This solution 1mL containing 5 $\mu$ g silicon.

## **4 Instruments and apparatus**

### **4.1**

Spectrophotometer.

### **4.2**

The carrier gas sealed evaporator (Figure 1).