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

YS/T 981.3-2014

**Methods for chemical analysis of high pure indium.
Determination of silicon content. Molybdenum blue
spectrophotometric method**

高纯铟化学分析方法硅量的测定硅钼蓝分光光度法

(English Translation)

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Foreword

YS/T 981 "Methods for chemical analysis of high purity indium" is divided into five sections.

--- Part 1. magnesium, aluminum, silicon, sulfur, iron, nickel, copper, zinc, arsenic, silver, cadmium, tin, thallium, lead quality measurement resolution glow discharge mass Spectroscopy;

--- Part 2. Inductively magnesium, aluminum, iron, nickel, copper, zinc, silver, cadmium, tin, lead coupled plasma mass spectrometry;

--- Part 3. Determination of the amount of silicon molybdenum blue spectrophotometric method;

--- Part 4. Determination of tin content Phenylfluorone - bromo cetyl trimethylamine absorptiometry;

--- Part 5. Determination of thallium content Rhodamine B photometric method.

This section YS/T 981 Part 3.

This section drafted in accordance with GB/T 1.1-2009 given rules.

The non-ferrous metal part by the National Standardization Technical Committee (SAC/TC243) centralized.

This section is responsible for drafting units. non-ferrous metals and electronic materials analysis and testing center.

This section participated in the drafting unit. China Nonferrous Metals Industry Institute of Standards Metrology and Quality, Jinchuan Group Co., Ltd., a semiconductor Emei Institute materials, widely Xi Debang Technology Co., Ltd.

1 Scope

This section YS/T 981 specifies the method for determination of silicon content in high-purity indium.

This section applies to the determination of 99.9999% purity Indium content of silicon. Determination range $5 \times 10^{-5}\%$ ~ $2 \times 10^{-4}\%$.

2 Method summary

After the sample is dissolved by nitric acid, hydrofluoric acid is added conversion insoluble silica, boric acid complex with an excess of fluoride ions in a pH range from 1 to 1.5 Silicon and ammonium molybdate generate beta-type silicon molybdenum complex, then in 1.5mol/L sulfuric acid solution to isoamyl alcohol extraction, tin dichloride reduction, have Phase was measured at 630nm wavelength absorbance. Less than 2mg indium, 5 μ g arsenic, 5 μ g phosphorus, 0.5 μ g germanium does not interfere with the determination.

3 Reagents and Instruments

3.1

water is deionized water, the resistivity of $> 18\text{Mohm} \cdot \text{cm}$.

3.2

nitric acid ($\rho = 1.19\text{g/mL}$), pure class distinctions stored in plastic dropper bottle.

3.3

nitric acid (11), formulated by the nitric acid (3.2), stored in plastic dropper bottle.

3.4

sulfuric acid ($\rho = 1.84\text{g/mL}$), pure class distinctions.

3.5

sulfate (4.5mol/L), the preparation of sulfuric acid (3.4).

3.6

sulfate (1.5mol/L), the preparation of sulfuric acid (3.4).

3.7

ethanol.

3.8

hydrofluoric acid (12), pure class distinctions, the platinum distiller purified by distillation or polytetrafluoroethylene sub-boiling distillation purified by distillation, stored in polyethylene drop Bottle.

3.9

isoamyl alcohol, distilled after use.

3.10

boric acid solution. 60g/L, weighed 6g boric acid solution in 100mL of water. Store in a polyethylene bottle.

3.11

ammonium molybdate solution. 100g/L extra virgin. Weigh 10g ammonium molybdate solution 100mL hot water. Store in a polyethylene bottle.

3.12

tartaric acid solution. 100g/L, weighed 10g tartaric acid in 100mL of water. Store in a polyethylene bottle.

3.13

tin dichloride solution. 2g/L, weighed 0.2g tin dichloride dissolved 100mL 1.5mol/L sulfuric acid solution. The time is now equipped with.

3.14

Silicon standard solution (A). Weigh 2.5300g sodium silicate ($\text{Na}_2\text{SiO}_3 \cdot 9\text{H}_2\text{O}$), a 50mL beaker with a small amount of water moist, Add boiling water, stirring constantly to dissolve, let cool after moved into 500mL volumetric flask, dilute with water to the mark. Store in a polyethylene bottle. this Solution of silicon-containing 0.5g/L.

3.15

Silicon standard solution (B). Take 1.00mL solution (3.14) and transferred to 250mL volumetric flask, dilute to the mark, shake. Storage Polyethylene bottle. Solution of silicon-containing 2 $\mu\text{g}/\text{mL}$.

4 Apparatus and materials

4.1

Spectrophotometer.

4.2

platinum crucible. 30mL.