

ICS 77.040.30
CCS H 12

YS

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

YS/T 38.1-2009

Replacing YS/T 38.1-1992

**Chemical analysis methods of high pure gallium. Part 1:
Determination of silicon content. Molybdenum blue
spectrophotometry**

高纯镓化学分析方法 第1部分：硅量的测定钼蓝分光光度法
(English Translation)

Issued on: December 4, 2009

Implemented on: June 1, 2010

Issued by: Ministry of Industry and Information Technology

Table of Contents

- Foreword
- 1 Scope
- 2 Method summary
- 3 Reagents
- 4 Instrument
- 5 Step, Analysis
- 5.1 Sample
- 5.3 Blank test

Foreword

YS/T 38 "high purity gallium chemical analysis method" is divided into two parts.

--- Part 1. "Chemical analysis of gallium high-purity silicon content - Molybdenum blue spectrophotometric method";

--- Part 2. "high purity gallium chemical analysis of magnesium, titanium, chromium, manganese, nickel, cobalt, copper, zinc, cadmium, tin, lead, bismuth content - Inductively Coupled Plasma Mass Spectrometry. " this section YS/T 38 - Part 1.

The partial replacement of YS/T 38.1-1992 "purity gallium chemical analysis of molybdenum blue spectrophotometric method for determination of silicon content." this section compared with YS/T 38.1-1992, have the following main changes.

--- The original method of presentation format has been modified.

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

This section is responsible for drafting unit. Beijing Nonferrous Metal Research Institute.

Participated in the drafting of this section. Zhuzhou Smelter Group, Emei Semiconductor plant.

1 Scope

YS/T of the provisions of section 38 of the method for the determination of silicon content in high purity gallium.

This section applies to gallium (99.9999%) Determination of silicon content. Measurement

range from 0.00001% to 0.00005%.

2 Method summary

Sample decomposition with hydrochloric acid gas at about 200 °C volatile separation of gallium trichloride; hydrofluoric acid solution polymerization of silicic acid, boric acid complex fluoride ions;

Silicon molybdenum blue method in a spectrophotometer absorbance was measured at a wavelength of 810nm.

3 Reagents

The water in this portion of deionized water (resistivity greater than 15Mohm · cm).

3.1

hydrochloride (rho1.19g/mL).

3.2

sulfate (rho1.84g/mL), pure class distinctions.

3.3

sulfate (35 + 1), the preparation of sulfuric acid (3.2).

3.4

sulfate (1 + 1), the preparation of sulfuric acid (3.2).

3.5

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

3.6

boric acid (40g/L), pure class distinctions.

3.7

Ammonium molybdate (50g/L), high purity.

3.8

tartaric acid (30%), pure class distinctions.

3.9

reducing agent. 1-amino-2-naphthol -4-2- acid (2mg/mL).

Silicon 3.10 Standard stock solution. Weigh 0.2139g silicon dioxide were placed in a platinum crucible, sodium carbonate and potassium carbonate was added 2g (2.1) mixed Co-reagent, stir melted until clear. After cooling, transferred to 1000mL volumetric flask,

dilute to the mark, mix, immediately go to a plastic bottle in. This solution 1mL containing 100 μ g silicon.

3.11

Silicon standard solution. Pipette 10.0mL silicon standard stock solution (3.10) into 1000mL volumetric flask, dilute to the mark with water, mix Uniform, immediately go to a plastic bottle. This solution 1mL containing 1 μ g silicon.

4 Instrument

4.1

Spectrophotometer.

4.2

gallium separation means.

5.1 Sample

Weigh 1g sample, accurate to 0.0001g.

5.2 Determination of the number of Three independently measured sample and averaged.

5.3 Blank test

Along with sample blank test.