

ICS 77.040.30
CCS H 12

YS

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

YS/T 244.2-2008

Replacing YS/T 244.2-1994

**Chemical analysis methods of high purity aluminium. Part 2:
Determination of silicon content by extraction-molybdenum
blue photometric method**

高纯铝化学分析方法 第2部分：钼蓝萃取光度法测定硅含量

(English Translation)

Issued on: March 12, 2008

Implemented on: September 1, 2008

Issued by: National Development and Reform Commission

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Foreword

YS/T 244 "Chemical analysis methods of high purity aluminum" is divided into nine sections.

- Part 1. phenanthroline - thiocyanate spectrophotometric determination of iron content;
- Part 2. molybdenum blue extraction and spectrophotometric determination of silicon content;
- Part 3. Two-antipyrine DAM - spectrophotometric determination of titanium content thiocyanate;
- Part 4. Butyl Rhodamine B spectrophotometric determination of gallium content;
- Part 5. Determination of copper, zinc and lead content anodic stripping voltammetry;
- Part 6. Catalytic manganese - sulfuric acid system through the determination of silver content;
- Part 7. dithizone extraction and spectrophotometric determination of cadmium content;
- Part 8. crystal violet extraction and spectrophotometric determination of indium content;
- Part 9. Determination of impurities by inductively coupled plasma mass spectrometry.

This is Part 2.

The partial replacement of YS/T 244.2-1994 "Determination of silicon content of high purity aluminum for chemical analysis of molybdenum blue extraction." this part is YS/T 244.2-1994 revision. Compared with YS/T 244.2-1994, the main changes are as follows.

- Reducing agent ascorbic acid increased;
- Added "repeatability" clause;
- Increase the "quality assurance and control" clause.

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

This part of the Fushun Aluminum Co., Ltd., China Nonferrous Metals Industry Institute of Standards Metrology and Quality is responsible for drafting.

This part of the Fushun Aluminum Co. drafted.

1 Scope

This section specifies the determination method of high purity silicon content.

This section applies to the determination of high purity silicon content. Measurement range. ~ 0.00010% 0.00080%.

2 Method summary

The sample is dissolved with sodium hydroxide, sulfuric acid, acidity 0.2mol/L ammonium molybdate is formed when silicon and silicon molybdenum heteropoly acid, and then increase the acidity to 3.6mol/L, with a reducing agent solution is reduced to silicon molybdenum blue to n-amyl alcohol extracted wavelength spectrophotometer measuring the absorbance at 800nm degree. High purity aluminum impurities present do not interfere with the determination.

3 Reagents

Reagent preparation and analysis of water are deionized water and then purified by distillation quartz stiller.

3.1

ethanol, pure class distinctions.

3.2

n-amyl alcohol.

3.3

sulfuric acid (1 + 1), pure class distinctions.

3.4

hydrochloric acid (1 + 3), pure class distinctions.

3.5

ammonium molybdate solution (100g/L) pure class distinctions. This storage is a solution in a polyethylene bottle.

3.6 Reducing agent solution

3.6.1 1- amino-2-naphthol 4-sulfonic acid (1g/L). Weigh 0.5g 1- amino-2-naphthol 4-sulfonic acid (acid 1.2.4) and 5g None aqueous sodium sulfite Was dissolved in 500mL of water, add 1mL of glacial acetic acid, and mix. The solution was stored in a brown bottle in a cool place, in a week.

3.6.2

ascorbic acid solution (10g/L), pure class distinctions. The time is now equipped with.

3.7 Sodium hydroxide solution (160g/L), pure class distinctions. This storage is a solution in a polyethylene bottle.

3.8 sulfuric acid (4.0mol/L), pure class distinctions.

3.9 Aluminum solution. Weigh 3.000g ultra-pure aluminum (or silicon content of less than 0.0001% of high purity) was placed in 400mL polyethylene cup (with cover) the sodium hydroxide solution was added 60.0mL (3.7), was heated on a boiling water bath to dissolve completely, then held 5min. Remove the polyethylene cup, add Into 70mL water, stirring constantly (polyethylene bar), the solution of 78.0mL sulfuric acid (3.8), on a boiling water bath heated to dissolve the salts cleared. take Under a polyethylene cup, cooled to room temperature, diluted with water to 210mL, and mix. Stored in polyethylene bottles. 35mL solution containing 0.5g of aluminum.

3.10 reagent solution. In a polyethylene cup 400mL sodium hydroxide solution was added 60.0mL (3.7), then sulfuric acid was added 36.0mL (3.8), Cold to room temperature, diluted with water to 210mL, and mix. Stored in polyethylene bottles.

3.11 Silicon Storage standard solution. Weigh 0.2140g previously burning 1h at 1000 °C high-temperature furnace, and the dryer to cool to room temperature Silica (99.9%), placed in a covered platinum crucible. 5g of anhydrous sodium carbonate, and mix. Melted at 950 °C high temperature furnace 15min, then cool, beaker, add 800mL of hot water, heating and stirring leaching frit, washed with water crucible, cooled to room temperature and transferred to 1L volumetric flask, dilute with water to volume, and mix. Stored in polyethylene bottles. This standard solution 1mL containing 0.1mg silicon.

3.12 Silicon standard solution. Pipette 10.0mL silicon standard stock solution (3.11), into the 100mL volumetric flask, dilute to the mark with water, mix uniform. Then from this solution Pipette 20.0mL, put another 100mL flask, dilute with water to volume, and mix. Stored in polyethylene bottles in. This solution 1mL containing 2μg silicon. The time is now equipped with.