

ICS 77.040.30
CCS H 12

YS

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

YS/T 244.5-2008

Replacing YS/T 244.5-1994

**Chemical analysis methods of high purity aluminium. Part 5:
Determination of copper, zinc and lead content by anodic
stripping voltammetric method**

高纯铝化学分析方法 第5部分：阳极溶出伏安法测定铜、锌和铅含量

(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 5.

The partial replacement of YS/T 244.5-1994 "Chemical analysis methods of high purity aluminum anodes - Determination of copper, zinc and lead content stripping voltammetry." this part is YS/T 244.5-1994 revision. Compared with YS/T 244.5-1994, the main changes are as follows.

- 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 provides high purity determination of copper, zinc and lead content.

This section applies to the determination of high purity copper, zinc and lead content.

Measurement range. Copper. 0.00005% - 0.00050%; zinc.

0.00002% - 0.00050%; Lead. ~ 0.000003% 0.000060%.

2 Method summary

Sample was dissolved in nitric acid and hydrochloric acid, heating evaporation, acidity about pH = 3, the measured voltammetry using platinum ball silver Mercury Film Electrode Anodic Stripping Fixed copper and zinc; determination of lead glass carbon electrode by anodic stripping voltammetry. High purity aluminum impurities present 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

argon (99.99%).

Nitrate 3.3 (rho1.42g/mL), of high purity.

3.4

nitric acid (1 + 1), of high purity.

3.5

hydrochloric acid (1 + 1), high purity or purified by gas balance.

Hydrochloride 3.6 (1 + 3), of high purity.

3.7

mercuric chloride stock solution. Weigh 0.5000g mercuric chloride, placed in 200mL beaker, add 50mL water, 1mL hydrochloric acid (3.5) stir Mix until completely dissolved. Transferred

to 100mL volumetric flask, dilute with water to volume, and mix. 1mL solution containing 5mg of mercury chloride.

3.8

mercuric chloride solution. Pipette 10.80mL mercuric chloride stock solution (3.7) in 100mL volumetric flask, dilute with water to volume, and mix.

This solution 1mL containing 0.54mg of mercury chloride.

3.9

copper standard stock solution. Weigh 0.5000g copper (99.99%), placed in 200mL beaker, add 20mL of nitric acid (3.4), dissolved by heating on a hot plate, and evaporated to near a paste. Added 10mL of hydrochloric acid (3.5) and heated to a volume of about 2mL, remove the cold However, wash the cup wall and transferred to 500mL volumetric flask, dilute with water to volume, and mix. 1mL solution containing 1mg of copper.

3.10

Copper standard solution. Pipette 25.0mL copper standard stock solution (3.9) in 250mL volumetric flask, dilute with water to volume, and mix. again from this solution Pipette 20.0mL, placed in 200mL volumetric flask, dilute with water to volume, and mix. This solution 1mL containing 10 μ g copper.

3.11

standard zinc stock solution. Weigh 0.5000g zinc (99.99%), placed in 200mL beaker, add 10mL hydrochloric acid (3.5), on a hot plate heated to dissolve completely, remove cooling, wash the cup wall and transferred to 500mL volumetric flask, dilute to the mark with water, mix uniform. 1mL solution containing 1mg zinc.

3.12

Zinc standard solution. Pipette 25.0mL zinc standard solution (3.11) in 250mL volumetric flask, dilute with water to volume, and mix. again from this solution Pipette 10.0mL in 200mL volumetric flask, dilute with water to volume, and mix. This solution 1mL containing 5 μ g zinc.

3.13

lead standard stock solution. Weigh 0.5000g metallic lead (99.99%), placed in 200mL beaker, add 20mL of nitric acid (3.4), dissolved by heating on a hot plate, and evaporated to near a paste. Added 10mL of hydrochloric acid (3.5), heated to distill to a volume of about 2mL, remove the cold However, wash the cup wall and transferred to 500mL volumetric flask, dilute with water to volume, and mix. 1mL solution containing 1mg lead.

3.14

Lead standard solution. Pipette 25.0mL lead standard stock solution (3.13) in 250mL volumetric flask, dilute with water to volume, and mix.

Then from this solution Pipette 10.0mL in 200mL volumetric flask, dilute with water to volume, and mix. This solution 1mL containing 5 μ g lead.