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

YS/T 1116.3-2016

**Methods for chemical analysis of tin anode slime--Part 3:
Determination of copper, lead and bismuth contents--Flame
atomic absorption spectrometric method**

锡阳极泥化学分析方法 第3部分：铜量、铅量和铋量的测定 火焰原子吸收光谱法
(English Translation)

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Foreword

YS/T 1116-2016 "tin anode mud chemical analysis method" is divided into seven parts.

- Part 1. Determination of tin content Potassium iodate titration;
- Part 2. Determination of bismuth content Na₂EDTA titration;
- Part 3. Determination of copper content, lead content and bismuth - Flame atomic absorption spectrometric method;
- Part 4. Determination of arsenic iodine titration;
- Part 5. Determination of indium - Flame atomic absorption spectrometric method;
- Part 6. Determination of gold and silver - Part 7. Determination of antimony content - Cerium sulfate titration method.

This part is Part 3 of YS/T 1116-2016.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This part of the National Nonferrous Metals Standardization Technical Committee (SAC/TC243) proposed and centralized.

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Method for chemical analysis of tin anode Part 3. determination of copper content, lead content and bismuth content Flame atomic absorption spectrometry

1 Scope

This part of YS/T 1116 specifies the method for the determination of copper, lead and bismuth in tin anodic mud.

This part is applicable to the determination of copper content, lead content and bismuth content in tin anode mud. The measurement range is shown in Table 1.

Table 1 Measurement range

Element	Cu	Pb	Bi
Measurement range /%	1.00 ~ 5.00	0.50 ~ 5.00	1.00 ~ 5.00

2 Method summary

Samples with hydrochloric acid, nitric acid, perchloric acid decomposition, hydrobromic acid volatilization to remove tin and antimony. In dilute hydrochloric acid medium, use air-acetylene flame Atomic Absorption Spectrometer at the corresponding wavelength (see Table 2), measure the absorbance of each element, according to the standard curve method to calculate its content.

Table 2 Determination of wavelength

Element	Cu	Pb	Bi
Wavelength/nm	324.7	283.3	223.1

3 Reagent

Unless otherwise stated, only the reagents and secondary water confirmed to be analytical were used in the analysis.

3.1

Hydrochloric acid (ρ 1.19g/mL).

3.2

nitric acid (ρ 1.42g/mL).

3.3

hydrobromic acid (ρ 1.49 g/mL).

3.4

perchloric acid (ρ 1.67g/mL).

3.5

Hydrochloric acid (1 1).

3.6

nitric acid (1 1).

3.7

copper standard storage solution. Weigh 1.0000g metal copper ($w_{Cu} \geq 99.99\%$) in 400mL beaker, add 50mL nitric acid (3.6), slightly hot to dissolve completely, remove the cooling, into the 1000mL volumetric flask, add 50mL nitric acid (3.6), diluted with water to the mark, Mix well. 1 mL of this solution contains 1 mg of copper.

3.8

lead standard storage solution. Weigh 1.0000g metal lead ($w_{Pb} \geq 99.99\%$) in 400mL beaker, add 50mL nitric acid (3.6), slightly hot to dissolve completely, remove the cooling, into the 1000mL volumetric flask, add 50mL nitric acid (3.6), diluted with water to the mark, Mix well. This solution 1mL containing 1mg of lead.

3.9

bismuth standard storage solution. weighed 1.0000g metal bismuth ($w_{Bi} \geq 99.99\%$) in 400mL beaker, add 50mL nitric acid