

ICS 77.120.40
CCS H 13

YS

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

YS/T 1116.2-2016

**Methods for chemical analysis of tin anode slime--Part 2:
Determination of bismuth content--Na₂EDTA titrimetric method**

锡阳极泥化学分析方法 第2部分：铋量的测定 Na₂EDTA滴定法

(English Translation)

Issued on: July 11, 2016

Implemented on: January 1, 2017

Issued by: Ministry of Industry and Information Technology

Table of Contents

Foreword

1 Scope

2 Normative reference documents

3 Method summary

4 Reagent

4.11 Na₂EDTA standard titration solution (cNa₂EDTA~0.010mol/L)

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 2 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.

This part of the main drafting unit. Beijing Mining and Metallurgy Research Institute, Yunnan Tin Industry Co., Ltd.

This part participates in the drafting unit. China Inspection and Certification Group Guangxi Co., Ltd., Hunan Nonferrous Metals Research Institute, Guangzhou Nonferrous Metal Research Academy.

This part of the main drafters. Kuai Lijun, Tang Shufang, Chen Diangeng, Zhao Ruolin, Wang Junfeng, Zhang Lianhe, Liang Feiping, Li Yan, Huang Puying, Wei Yajuan, Pang Wenlin, Zhang Tianjiao.

Method for chemical analysis of tin anode Part 2. determination of bismuth content
Na₂EDTA titration

1 Scope

This part of YS/T 1116 specifies the method for the determination of the amount of bismuth in the tin anode.

This part is applicable to the determination of bismuth in tin anode mud. The measurement range is 5.00% ~ 20.00%.

2 Normative reference documents

The following documents are indispensable for the application of this document. For dated references, only the dated edition applies to this article Pieces. For undated references, the latest edition (including all amendments) applies to this document.

YS/T 1116.5-2016 Methods for chemical analysis of tin anodes - Part 5. Determination of indium content - Flame atomic absorption spectrometric method

3 Method summary

Samples with hydrochloric acid, nitric acid, perchloric acid decomposition, hydrobromic acid volatilization to remove antimony, arsenic and tin. With tartaric acid, ascorbic acid, thiourea mask a small amount Tin, antimony, arsenic, iron, copper and other elements, with ammonia to adjust the pH value of 1.5 to 1.7, with xylenol orange as indicator, with Na₂EDTA standard titration Solution titration bismuth, indium amount, minus the amount of bismuth equivalent to indium, the amount of bismuth.

4 Reagent

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

4.1

ascorbic acid.

4.2

Hydrochloric acid (ρ 1.19g/mL).

4.3

nitric acid (ρ 1.42g/mL).

4.4

perchloric acid ($\rho=1.67\text{g/mL}$).

4.5

hydrobromic acid ($\rho=1.49\text{g/mL}$).

4.6

nitric acid (1:1).

Ammonia water (1:1).

4.8

tartaric acid solution (100g/L).

4.9

thiourea saturated solution.

4.10

bismuth standard solution. weighed 2.0000g metal bismuth ($w_{\text{Bi}} \geq 99.99\%$) in 250mL beaker, add 50mL nitric acid (4.6), low Warm to dissolve completely, boil to remove the nitrogen oxide, remove the cooling, into the 1000mL volumetric flask, add 50mL nitric acid (4.6), Diluted with water to the mark, mix. This solution 1mL containing 2mg bismuth.

4.11 Na₂EDTA standard titration solution ($c_{\text{Na}_2\text{EDTA}} \sim 0.010\text{mol/L}$)

4.11.1

Preparation. Weigh 3.8g ethylenediamine tetraacetic acid disodium ($\text{C}_{10}\text{H}_{14}\text{N}_2\text{O}_8\text{Na}_2 \cdot 2\text{H}_2\text{O}$) in a 500mL beaker, add 100mL Water, heating and dissolving completely, cooling to room temperature, into the 1000mL reagent bottle, diluted with water to 1000mL, mix. Place 3d after 3d