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

YS/T 745.7-2010

**Methods for chemical analysis of copper anode slime. Part 7:
Determination of bismuth content. Flame atomic absorption
spectrometric method and Na₂EDTA titrimetric method**

铜阳极泥化学分析方法 第7部分：铋量的测定 火焰原子吸收光谱法和Na₂EDTA滴
定法

(English Translation)

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Foreword

YS/T 745 "Methods for chemical analysis of copper anode mud" is divided into nine sections.

--- Part 1. Determination of copper content iodometry;

--- Part 2. gold and silver content determination fire assay gravimetric method;

--- Part 3. the amount of platinum and palladium contents - fire assay enrichment - Inductively coupled plasma atomic emission spectrometry;

--- Part 4. Determination of the amount of selenium iodometry;

--- Part 5. Determination of tellurium content dichromate method;

--- Part 6. Determination of lead content Na₂EDTA titration;

--- Part 7. Determination of bismuth content - Flame atomic absorption spectrometric method and Na₂EDTA titration;

--- Part 8. Determination of arsenic content by hydride generation - atomic fluorescence spectrometry;

--- Part 9. Determination of antimony content - Flame atomic absorption spectrometry.

This is Part 7.

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

The non-ferrous metal part by the National Standardization Technical Committee (SAC/TC243) centralized.

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Methods for chemical analysis of copper anode slime Part 7. Determination of bismuth content Flame atomic absorption spectrometry and titration Na₂EDTA

1 Method, flame atomic absorption spectrometry

1 Scope

YS/T 745 method specifies the method for determination of bismuth in copper anode mud content.

This method is applicable to the determination of bismuth in copper anode mud, the measurement range. 1.00% to 5.00%.

2 Method summary

Sample with a mixed acid dissolved, antimony tartrate eliminate interference, the use of air - acetylene flame atomic absorption spectrometer wavelength 223.1nm Bismuth measured absorbance, calculated according to the quality of working curves bismuth score.

3 Reagents

Unless otherwise indicated in the analysis using only recognized as analytical grade reagents and distilled or deionized water or equivalent purity.

3.1

hydrochloride (rho1.19g/mL).

3.2

hydrochloric acid (119).

Nitrate 3.3 (rho1.42g/mL).

3.4

mixed acid. hydrochloric acid, nitric acid (31).

3.5

tartaric acid solution (200g/L).

3.6

Bismuth standard solution. Weigh 0.5000g of bismuth ($\geq 99.99\%$), placed in 250mL beaker, add 50mL of nitric acid (11), cover Dish surface, low heat until completely dissolved, boiled to remove nitrogen oxides, removed, cooled, treated with nitric acid (124) and the cup wall deterative dish, transferred 1000mL volumetric flask, and dilute to volume with nitric acid (124), and mix. This solution 1mL containing 0.5mg bismuth.

4 Instrument

Atomic absorption spectrometer, with a bismuth hollow cathode lamp.

Under optimum working conditions for those who can reach the following indicators can be used.

--- Sensitivity. a solution consistent with the measurement matrix solution, measuring the characteristic concentration of bismuth standard solution should be less than $0.35\mu\text{g/mL}$.

--- Precision. standard solution with the highest concentration of 10 times the absorbance measurements, the standard deviation should not exceed the average absorbance of 1.0% the lowest concentration of standard solution used (instead of "zero" concentration of the solution) absorbance measured 10 times, and the standard deviation is not more than the highest standard concentration 0.5% average standard solution absorbance.

--- Working curve. The curve will be divided into five sections according to concentration, than the difference between the absorbance of the absorbance values of the highest and the lowest segment should not less than 0.75.