

ICS 77.040.30

CCS H 13

YS

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

YS/T 716.3-2009

**Methods for chemical analysis of low grade blister. Part 3:
Determination of bismuth, nickel, lead, antimony and zinc
contents. Flame atomic absorption spectrometry**

黑铜化学分析方法 第3部分：铋、镍、铅、锑和锌量的测定 火焰原子吸收光谱法
(English Translation)

Issued on: December 4, 2009

Implemented on: June 1, 2010

Issued by: Ministry of Industry and Information Technology

Table of Contents

Foreword

1 Scope

2 Principle of the method

3 Reagents

Foreword

YS/T 716-2009 "chemical analysis of black copper" is divided into six parts.

--- Part 1. Determination of copper content of sodium thiosulfate titration;

--- Part 2. Determination of the amount of gold and silver fire assay;

--- Part 3. Flame atomic bismuth, nickel, lead, antimony and zinc content absorption spectrometry;

--- Part 4. Determination of arsenic content iodometry;

--- Part 5. Determination of tin content potassium iodate titration;

--- Part 6. arsenic, bismuth, nickel, lead, antimony, tin, zinc content - Inductively coupled plasma atomic emission spectrometry.

This section YS/T Part 3 716.

Appendix A of this section is an informative annex.

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

This section is responsible for drafting unit. Tongling Nonferrous Metals Group Holdings Limited.

This section is drafted. Daye Nonferrous Metals Company.

Participated in the drafting of this section. Beijing Nonferrous Metal Research Institute, Chinalco Luoyang Copper Co., Ltd.

1 Scope

YS/T of the provisions of the section 716 determination of black copper, bismuth, nickel, lead, antimony and zinc content.

This section applies to the determination of black copper, bismuth, nickel, lead, antimony

and zinc content, measuring range in Table 1.

Table 1 Measuring range

Element	Bi	Ni	Pb	Sb	Zn	Content /%
	~ 0.050	0.20 ~ 0.50	0.40 ~ 0.35	2.00 ~ 0.60	0.20 ~ 0.20	2.00

2 Principle of the method

Determination of bismuth, antimony. the sample is dissolved in nitric acid, the ammonia solution to ferric hydroxide and lanthanum hydroxide as carrier co-precipitation of bismuth and antimony, and copper Separation in dilute hydrochloric acid, tartaric acid medium with air - acetylene flame atomic absorption spectrometer to measure the wavelength of the elements listed in Table 2 Absorbance.

Nickel, lead, zinc determination. sample with hydrochloric acid, hydrogen peroxide dissolved in 15% hydrochloric acid medium, with air - acetylene flame in atomic absorption the spectrometer wavelength listed in Table 2 by measuring the absorbance of each element.

Table 2 elements corresponding to the wavelength

Element	Bi	Ni	Pb	Sb	Zn	Wavelength/nm
	223.1	232.0	283.3	217.6	213.9	

3 Reagents

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

Nitrate 3.1 (rho1.42g/mL).

3.2

hydrochloride (rho1.19g/mL).

3.3

Ammonia (rho1.90g/mL).

3.4

HCl (1 + 1).

3.5

hydrochloric acid (1 + 19).

3.6

hydrochloric acid (1 + 49).

3.7

nitric acid (1 + 1).

3.8

Aqueous ammonia (24 + 1).

3.9

Hydrogen peroxide.

3.10

ferric nitrate solution. Weigh 73.40g of ferric nitrate $[\text{Fe}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}]$ in 500mL beaker, dissolved in water, added 100mL nitric acid (3.7), transfer to 1000mL volumetric flask, dilute with water to volume, and mix. This solution 1mL iron 10mg.

3.11

lanthanum nitrate solution. Weigh 14.68g lanthanum oxide (La_2O_3) in 250mL beaker, blown small amount of water, nitric acid was added 50mL (3.7), dissolved by heating, micro boiling rid of nitrogen oxides, removed, cooled and transferred to 500mL volumetric flask, dilute with water to volume, and mix. this 1mL solution containing lanthanum 25mg.

3.12

tartaric acid solution (100g/L). Weigh 100g of tartaric acid into 500mL beaker, dissolved in water and transferred to 1000mL capacity