

ICS 77.120.99

CCS H 13

YS

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

YS/T 227.12-2011

**Methods for chemical analysis of tellurium. Part 12: Determination of bismuth,
aluminum, lead, iron, selenium, copper, magnesium, sodium, arsenic content.
Inductively coupled plasma-atomic emission spectrometry**

碲化学分析方法 第12部分：铋、铝、铅、铁、硒、铜、镁、钠、砷量的测定电
感耦合更离子体原子发射光谱法

(English Translation)

Issued on: December 20, 2011

Implemented on: July 1, 2012

Issued by: Ministry of Industry and Information Technology

Table of Contents

Foreword

1 Scope

2 Principle of the method

3 Reagents

3.1 High-purity tellurium ($\geq 99.999\%$)

Foreword

YS/T 227 "tellurium chemical analysis methods," a total of 12 sections.

--- Part 1. Determination of bismuth content hydride generation - atomic fluorescence spectrometry;

--- Part 2. Determination of aluminum content Chromazurol S- bromo cypylridinium micellar solubilization spectrophotometry;

--- Part 3. Determination of lead content by flame atomic absorption spectrometry;

--- Part 4. Determination of iron content - Phenanthroline spectrophotometric method;

--- Part 5. determination of selenium content of 2,3-diaminonaphthalene spectrophotometry;

--- Part 6. Determination of copper content of solid-liquid separation - flame atomic absorption spectrometry;

--- Part 7. Determination of sulfur content by inductively coupled plasma atomic emission spectrometry;

--- Part 8. magnesium, sodium content - Flame atomic absorption spectrometry;

--- Part 9. Determination of tellurium content of potassium dichromate - ammonium ferrous sulfate volumetric method;

--- Part 10. Determination of arsenic content by hydride generation - atomic fluorescence spectrometry;

--- Part 11. Determination of silicon content of n-butanol silicon molybdenum blue spectrophotometric method;

--- Part 12. bismuth, aluminum, lead, iron, selenium, copper, magnesium, sodium, arsenic content - Inductively coupled plasma atomic emission spectrometry.

This is Part 12.

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

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

This section is responsible for drafting unit. Zhuzhou Smelter Group Co., Ltd.

Participated in the drafting of this section. Beijing General Research Institute of Mining and Metallurgy, Shuikoushan Nonferrous Metals Group Co., Ltd., Jiangxi Copper Group Company, Sichuan Apollo Solar Energy Technology Co., Ltd.

1 Scope

This section specifies the determination by inductively coupled plasma atomic bismuth tellurium, aluminum, lead, iron, selenium, copper, magnesium, sodium, arsenic emission spectrum method.

This section applies to multi-element tellurium, bismuth, aluminum, lead, iron, selenium, copper, magnesium, sodium, simultaneous determination of arsenic content, but also for one Determination of the elements, or any combination of several elements. Determination of the range in Table 1.

Table 1 element Measuring range

Element measurement range /% Bi, Al, Cu, Mg, Na, As 0.0005 ~ 0.005 Pb, Fe 0.0005 ~ 0.010 Se 0.0005 ~ 0.060

2 Principle of the method

The sample is dissolved in acid, in an acidic medium, in inductively coupled plasma atomic emission spectrometer, for each element corresponding to the wavelength Measuring the emission intensity, calculate the mass fraction of each test element according to the working curve.

3 Reagents

Unless otherwise indicated in the analysis using only the reagents and confirmed analytically pure deionized water.

3.1 High-purity tellurium ($\geq 99.999\%$)

3.2 nitrate ($\rho 1.43\text{g/mL}$), pure class distinctions.

3.3 hydrochloric acid ($\rho 1.19\text{g/mL}$), pure class distinctions.

3.4 mixed acid. 1 part of nitric acid, hydrochloric acid mixing 3 parts.

3.5 bismuth stock standard solution. Weigh 1.0000g bismuth ($\geq 99.99\%$), placed in 100mL

beaker, add 10mL of nitric acid, low Heated dissolved completely, add 90mL of nitric acid, cooled and transferred to 1000mL volumetric flask with water to volume, and mix. This solution 1mL 1mg containing bismuth.

3.6 Aluminum stock standard solution. Weigh 1.0000g of aluminum ($\geq 99.99\%$), placed in 100mL beaker, add 20mL hydrochloric acid (11), low heat to dissolve completely cooled and transferred to 1000mL volumetric flask, dilute with water to the mark. This solution containing 1mL 1mg aluminum.