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

YS/T 1158.3-2016

**Methods for chemical analysis of copper-indium-gallium-selenide target. Part 3:
Determination of aluminum, iron, nickel, chromium, magnesium, lead, zinc, cadmium,
cobalt, molybdenum, barium content and manganese contents. Inductively coupled
plasma mass sp**

铜铟镓硒靶材化学分析方法 第3部分：铝、铁、镍、铬、锰、铅、锌、镉、钴、
钼、钡、镁量的测定 电感耦合等离子体质谱法

(English Translation)

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Foreword

YS/T 1158 "copper indium gallium selenium target chemical analysis method" is divided into the following three parts.

- Part 1. Determination of gallium content and indium content - Inductively coupled plasma atomic emission spectrometry;

- Part 2. Determination of selenium weight method;

Part 3. Determination of aluminum, iron, nickel, chromium, manganese, lead, zinc, cadmium, cobalt, molybdenum, barium and magnesium - Inductively coupled plasma mass spectrometry.

This section is part 3 of YS/T 1158.

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. Guangxi Zhuang Autonomous Region Metallurgical Products Quality Supervision and Inspection Station, Liuzhou 100 ten special advanced materials Limited.

This part participates in the drafting unit. Guangxi Zhuang Autonomous Region Analysis and Testing Research Center, Guangzhou Nonferrous Metals Research Institute, Beijing Mining and Metallurgy Research General Hospital.

1 Scope

YS/T 1158 This section specifies the determination of aluminum, iron, nickel, chromium, manganese, lead, zinc, cadmium, cobalt, molybdenum, barium and magnesium in copper indium gallium selenium target.

This part is suitable for the determination of aluminum, iron, nickel, chromium, manganese, lead, zinc, cadmium, cobalt, molybdenum, barium and magnesium in copper indium gallium

selenium target. The measurement range is 0.00005% to 0.0020%.

2 Method summary

The samples were dissolved in nitric acid and hydrochloric acid at low temperature. Scandium and rhodium were used as internal standard. The contents of aluminum, iron, nickel, chromium, Manganese, lead, zinc, cadmium, cobalt, molybdenum, barium, magnesium.

3 Reagent

The water used in the analysis is a grade of water. The containers used in the test were thoroughly soaked in nitric acid solution (1 19) and thoroughly washed with water clean.

3.1

nitric acid ($\rho = 1.42\text{g/mL}$). UP grade or equivalent purity.

3.2

Hydrochloric acid ($\rho = 1.19\text{ g/mL}$). UP grade or equivalent purity.

3.3

nitric acid (2 1).

3.4

Hydrochloric acid (2 1).

3.5

aluminum standard storage solution. Weigh 1.0000g metal aluminum ($w_{\text{Al}} \geq 99.99\%$), placed in a 300mL beaker, add 20mL hydrochloric acid (3.4), dropping 1mL ~ 2mL nitric acid (3.3), dissolving at low temperature, removing and cooling to room temperature, moving into 1000mL volumetric flask, adding 80mL hydrochloric acid (3.2), diluted with water to the mark, mix. 1 mL of this solution contains 1 mg of aluminum.

3.6

iron standard storage solution. Weigh 1.0000g metal iron ($w_{\text{Fe}} \geq 99.99\%$), placed in a 300mL beaker, add 40mL nitric acid (3.2), dissolved in low temperature heating, remove and cool to room temperature, into the 1000mL volumetric flask, diluted with water to the mark, mix. This solution 1mL Containing 1 mg of iron.

3.7

nickel standard storage solution. Weigh 1.0000g metal nickel ($w_{\text{Ni}} \geq 99.99\%$), placed in a 300mL beaker, add 20mL nitric acid (3.3), dissolved at low temperature, heated to remove nitrogen oxides, removed and cooled to room temperature, into the 1000mL volumetric flask, add 40mL nitric acid (3.1), diluted with water to the mark, mix well. This solution 1mL

containing 1mg nickel.

3.8

chromium standard storage solution. Weigh 3.7349g potassium chromate ($\text{K}_2\text{CrO}_4 \geq 99.99\%$, pre-bake at 105°C 1h), placed in 150mL Beaker, add 20mL water dissolved, add 10mL nitric acid (3.3), into the 1000mL volumetric flask, diluted with water to the mark, mix.

1mL of this solution contains 1mg of chromium.

3.9

Manganese standard storage solution. Weigh 1.0000 g of metal manganese ($\text{wMn} \geq 99.99\%$), placed in 150mL beaker, add 10mL nitric acid (3.3), dissolved by heating, boiled to remove nitrogen oxides, and cooled. Into the 1000mL volumetric flask, diluted with water to the mark, mix. This solution Liquid 1mL containing 1mg manganese.

3.10

lead standard storage solution. Weigh 1.0000g metal lead ($\text{wPb} \geq 99.99\%$), placed in 150mL beaker, add 10mL nitric acid