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

**YS/T 252.6-2020**

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**Methods for chemical analysis of nickel matte - Part 6:  
Determination of lead, zinc and arsenic contents - Inductively  
coupled plasma atomic emission spectrometry**

高镍钨化学分析方法 第6部分：铅、锌和砷含量的测定 电感耦合等离子体原子发射光谱法

**(English Translation)**

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## Foreword

YS/T 252 "Methods for chemical analysis of nickel matte" is divided into 8 parts:

- Part 1: Determination of nickel content - Dimethylglyoxime gravimetric method
- Part 2: Determination of iron content - Sulfosalicylic acid photometric method
- Part 3: Determination of cobalt content - Flame atomic absorption spectrometric method
- Part 4: Determination of cobalt content - Sodium thiosulphate titrimetric method
- Part 5: Determination of sulfur content - Combustion-neutralization titrimetric method
- Part 6: Determination of lead, zinc and arsenic contents - Inductively coupled plasma atomic emission spectrometry
- Part 7: Determination of silver content - Flame atomic absorption spectrometry
- Part 8: Determination of gold, platinum and palladium contents - Fire assay collection-inductively coupled plasma atomic emission spectrometry

This Part is Part 6 of YS/T 252.

This Part was drafted in accordance with the rules given in GB/T 1.1-2009.

This Part was proposed by AND shall be under the jurisdiction of the National

Nonferrous Metals Standardization Technical Committee (SAC/TC 243).

Drafting organizations of this Part: Jinchuan Group Co., Ltd., Beijing Mineral Inspection Technology Co., Ltd., GB (Beijing) Inspection and Certification Co., Ltd., Guangdong Industrial Analysis and Testing Center, Liaoning Entry-Exit Inspection and Quarantine Bureau Inspection and Quarantine Technology Center, Guangxi Zhuang Autonomous Region Metallurgical Products Quality Inspection Station, Lanzhou Jinchuan New Material Technology Co., Ltd., Shandong Hengbang Smelting Co., Ltd., Changsha Mining and Metallurgy Research Institute Co., Ltd., Guizhou Institute of Analysis and Testing, Guangxi CCIC Testing Technology Service Co., Ltd., Zhejiang Huayou Cobalt Industry Co., Ltd., Zhejiang Yatong Welding Materials Co., Ltd., Emeishan Eban High Purity Materials Co., Ltd., Guangxi Zhuang Autonomous Region Analysis and Testing Research Center.

## 1 Scope

This Part specifies methods for the determination of lead, zinc, arsenic content in high nickel matte.

This Part applies to the determination of lead, zinc, arsenic content in high nickel matte.

The measurement range is as shown in Table 1.

## 2 Method summary

The sample is decomposed with hydrochloric acid, nitric acid, perchloric acid. In dilute hydrochloric acid medium, the emission intensity of each element is measured on an inductively coupled plasma atomic emission spectrometer. The contents of lead, zinc, arsenic are calculated according to the working curve method.

## 3 Reagents

Unless otherwise stated, only reagents confirmed to be of superior purity are used in the analysis. All water used is water of grade-2 purity or above.

**5.2 The sample is pre-dried at 105 °C ± 5 °C for 2 hours, placed in a desiccator to cool**

to room temperature for later use.

**6.1 Sample**

Weigh 0.20 g of sample, accurate to 0.0001 g.

**6.2 Parallel test**

Conduct two tests in parallel,

**6.3 Blank test**

Do a blank test along with the sample.

**5 mL of nitric acid (3.2), 2 mL of perchloric acid (3.3). Heat at low temperature until**

the sample is completely dissolved. Continue heating. When the white smoke is gone, evaporate the test solution to dryness, then remove and cool it to room temperature.

Add 5 mL of hydrochloric acid (3.1). Rinse the watch plate and cup wall with a small amount of water. Heat to dissolve the salt. Remove and cool. Transfer the test solution into a 200 mL volumetric flask. Use water to dilute it to volume. Mix well.

**6.4.2 On the inductively coupled plasma atomic emission spectrometer, at the selected**

analysis spectrum line, measure the emission intensity of each element to be measured in the test solution (6.4.1) and the accompanying sample blank solution (6.3), simultaneously with the standard solution series. Calculate the blank-corrected mass concentration of each measured element from the working curve.

**6.5 Drawing of working curve**

Dilute the lead, zinc, arsenic standard storage solutions (3.8 ~ 3.10) step by step respectively. Prepare a series of mixed standard solutions of lead, zinc, arsenic according to Table 3. On an inductively coupled plasma atomic emission spectrometer, measure the emission intensity of lead, zinc, arsenic in a mixed series of standard

solutions, at the selected analysis spectral line. Draw the working curve, using the mass concentration of the element being measured as the abscissa and the emission intensity as the ordinate.

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