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

YS/T 461.7-2013

Replacing YS/T 461.7-2003

**Methods for chemical analysis of lead and zinc bulk
concentrates. Part 7: The determination of cadmium content.
Flame atomic absorption spectrometry**

混合铅锌精矿化学分析方法 第7部分：镉量的测定火焰原子吸收光谱法
(English Translation)

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Foreword

YS/T 461 "Lead and Zinc concentrates - Methods" is divided into 11 parts.

- Part 1. Determination of the amount of lead and zinc content Na₂EDTA precipitation titration;
- Part 2. Determination of iron content Na₂EDTA titration;
- Part 3. Determination of sulfur content of combustion - neutralization titration method;
- Part 4. Determination of arsenic content of iodine titration;
- Part 5. Determination of silicon dioxide content - Molybdenum blue spectrophotometric method;
- Part 6. Determination of the amount of mercury atomic fluorescence spectrometry;
- Part 7. Determination of cadmium content by flame atomic absorption spectrometry;
- Part 8. Determination of copper content - Flame atomic absorption spectrometry;
- Part 9. Determination of the amount of silver by flame atomic absorption spectrometry;
- Part 10. the amount of gold and silver contents - fire assay;
- Part 11. arsenic, bismuth, cadmium, cobalt, copper, nickel, antimony content - Inductively Coupled Plasma - Atomic Emission Spectrometry.

This section YS/T Section 7461 of.

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

The partial replacement of YS/T 461.7-2003 "Lead and Zinc concentrates - Methods for chemical analysis of cadmium content - Flame atomic absorption spectrometric Law, "compared with the YS/T 461.7-2003, the main changes are as follows.

--- Text format has been modified;

--- Added "reproducibility" clause, delete the words "to allow poor" clause;

--- Added "the test report" requirement.

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

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1 Scope

This section YS/T 461 specifies the method for determination of Lead and Zinc concentrate cadmium content.

This section applies to the determination of cadmium content in Lead and Zinc Concentrate. Measurement range. 0.050% to 1.00%.

2 Method summary

Samples with hydrochloric acid, nitric acid dissolved in dilute hydrochloric acid medium, using air - acetylene flame atomic absorption spectrometer wavelength 228.8nm at measuring the absorbance of cadmium. According to the standard curve method to calculate the content of cadmium.

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

hydrochloric acid ($\rho = 1.19\text{g/mL}$).

3.2

nitric acid ($\rho = 1.42\text{g/mL}$).

3.3

hydrochloride (11).

3.4

nitric acid (11).

3.5

cadmium standard stock solution. Weigh 1.0000g metal cadmium ($w_{cd} \geq 99.99\%$) in 250mL beaker, add 20mL of nitric acid (3.4), covered with a watch glass, low heat on a hot plate until completely dissolved in boiled purge nitrogen oxides. Remove cooling to room temperature, transferred to 1000mL volumetric flask, dilute with water to volume, and mix. This solution 1mL 1mg containing cadmium.

Cadmium 3.6 Standard solution. 5.00mL transferred cadmium standard stock solution (3.5) in 100mL volumetric flask, was added 5mL hydrochloric acid (3.3), washed with water Dilute to volume, and mix. This solution 1mL containing 50 μ g cadmium.

4 Instrument

Atomic absorption spectrometer attached cadmium hollow cathode lamp.

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

--- Characteristic concentration. a solution in the measurement matrix consistent solution, characteristic concentration of cadmium should be less than 0.020 μ 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%;

With the lowest concentration of standard solution (not "zero" concentration of the standard) measuring the absorbance of 10 times, the standard deviation should not exceed the maximum 0.5% of the average concentration of the standard solution absorbance.

--- Linear curve. The curve is divided into five sections according to concentration, absorbance difference between the absorbance difference between the highest and the lowest segment of the segment Ratio of not less than 0.8.

5 Sample

5.1

The specimen shall 0.100mm sieve through hole.