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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 8151.25-2023

Methods for chemical analysis of zinc concentrates - Part 25: Determination of indium content - Flame atomic absorption spectrometry

锌精矿化学分析方法 第25部分：铟含量的测定 火焰原子吸收光谱法

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Standardization Administration of the PRC

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Foreword

This document is in accordance with the provisions of GB/T 1:1-2020 "Guidelines for Standardization Work Part 1: Structure and Drafting Rules for Standardization Documents" drafting: This document is part 25 of GB/T 8151 "Methods for Chemical Analysis of Zinc Concentrates": GB/T 8151 has issued the following parts:

--- Part 1: Determination of zinc content, precipitation separation Na2EDTA titration method and extraction separation Na2EDTA titration method;

--- Part 2: Determination of sulfur content Combustion neutralization titration method;

--- Part 3: Determination of iron content Na2EDTA titration method;

--- Part 4: Determination of the amount of silica Molybdenum blue spectrophotometry;

--- Part 5: Determination of lead content by flame atomic absorption spectrometry;

--- Part 6: Determination of copper content by flame atomic absorption spectrometry;

--- Part 7: Determination of the amount of arsenic hydride generation - atomic fluorescence spectrometry and potassium bromate titration;

--- Part 8: Determination of the amount of cadmium flame atomic absorption spectrometry;

--- Part 9: Determination of the amount of fluorine ion selective electrode method;

--- Part 10: Determination of the amount of tin hydride generation - atomic fluorescence spectrometry;

--- Part 11: Determination of antimony content Hydride generation-atomic fluorescence spectrometry;

--- Part 12: Determination of silver content by flame atomic absorption spectrometry;

--- Part 13: Determination of the amount of germanium hydride generation-atomic fluorescence spectrometry and benzofluorenone spectrophotometry;

1 Scope

Part 25 of China's national series on the analysis of zinc concentrates, determining indium by flame atomic absorption spectrometry. Indium has no ore of its own. It occurs at trace levels in sphalerite, the zinc sulfide that is the world's zinc ore, and essentially all of it is recovered as a by-product of zinc smelting - which makes the indium content of a zinc concentrate a real component of its value rather than a curiosity. The demand is concentrated and inelastic: indium tin oxide is the transparent conductor of every LCD and touch screen, and there is no cheap substitute. China produces most of the world's supply, so this determination is made on a great deal of material. Flame AAS suits it because indium's absorption line is well behaved and the concentrations, while low, are within reach after the concentrate is dissolved. This part applies to the determination of indium in zinc concentrate over a mass fraction range of 0.0020 to 0.120 per cent.

This document describes a method for the determination of the indium content of zinc concentrates: This document is applicable to the determination of indium content in zinc concentrate: The determination range (mass fraction) is 0:0020%~0:120%:

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text: Among them, dated references For documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to this document:

GB/T 6682 Analytical laboratory water specifications and test methods

3 Terms and Definitions

This document does not have terms and definitions that need to be defined:

4 Principles

The sample was dissolved with hydrochloric acid, nitric acid, sulfuric acid: High content of indium is directly diluted; low content of indium is mixed with iodide ions in potassium iodide-sulfuric acid medium Complexation, extraction of trace indium with butyl acetate, and back extraction of indium into the aqueous phase with hydrochloric acid: Then in hydrochloric acid medium, use air-acetylene fire Flame, the absorbance of indium was measured at the wavelength of 303:9nm of the atomic absorption spectrometer, and the content of indium was calculated according to the standard curve method:

5 Reagents and materials

Unless otherwise stated, only reagents confirmed to be analytically pure and secondary water in accordance with GB/T 6682 were used in the analysis: 5:

1 Ascorbic acid: 5:

2 Ammonium fluoride: 5:

3 Hydrochloric acid (rho=1:19g/mL): 5:

4 Nitric acid (rho=1:42g/mL): 5:

5 Sulfuric acid (rho=1:84g/mL): 5:

6 Perchloric acid (rho=1:70g/mL): 5:

7 Butyl acetate: 5:

8 Hydrochloric acid solution (1 19): 5:

9 Sulfuric acid solution (19):