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CCS D40



**NATIONAL STANDARD OF THE  
PEOPLE'S REPUBLIC OF CHINA**

**GB/T 14353.19-2019**

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**Methods for chemical analysis of copper ores, lead ores and  
zinc ores - Part 19: Determination of tin content - Hydride  
generation atomic fluorescence spectrometry**

铜矿石、铅矿石和锌矿石化学分析方法 第19部分：锡量测定 氢化物发生原子荧光光谱法

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### Foreword

GB/T 14353 "Chemical Analysis Methods for Copper Ore, Lead Ore and Zinc Ore" is divided into 21 parts.

- Part 1. Determination of copper content;
- Part 2. Determination of lead content;
- Part 3. Determination of zinc content;
- Part 4. Determination of cadmium content;
- Part 5. Determination of nickel content;
- Part 6. Determination of cobalt content;
- Part 7. Determination of arsenic content;
- Part 8. Determination of volume;
- Part 9. Determination of molybdenum content;
- Part 10. Determination of tungsten content;
- Part 11. Determination of silver content;
- Part 12. Determination of sulfur content;
- Part 13. Determination of the amount of gallium, indium, niobium, tungsten and molybdenum;

### 1 Scope

GB/T 14353.19-2019 is the Chinese national standard on methods for chemical analysis of copper ores, lead ores and zinc ores - part 19: determination of tin content - hydride generation atomic fluorescence spectrometry, in the field of mining and minerals. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in

practice is how most foreign buyers meet it. It was issued on 18 October 2019 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 May 2020. Classification: ICS 73.060, CCS D40. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This part of GB/T 14353 specifies the determination of tin in copper ore, lead ore and zinc ore by hydride generation atomic fluorescence spectrometry. content. This section applies to the determination of tin content in copper ore, lead ore and zinc ore by hydride generation atomic fluorescence spectrometry. Measuring range. 0.001% to 1.0% (mass fraction).

## 2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article. Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 6682 Analytical laboratory water specifications and test methods

GB/T 14505 General rules and general rules for chemical analysis of rocks and ores

## 3 Principle

The sample is dissolved in hydrochloric acid and nitric acid, and the pH of the sample solution is adjusted to

4.5 with ammonia water. The iron hydroxide is used as a carrier to make tin and  $\text{Fe}(\text{OH})_3$  together. Precipitation, separation of copper, lead, zinc. The tin-containing precipitate and the acid-insoluble matter are melted by sodium oxide, extracted by hot water, and subjected to secondary separation with the interference component. In the acidic medium, tartaric acid-thiourea-ascorbic acid is added as a masking agent, and tin reacts with potassium borohydride to form hydrogen sulfide, which is loaded into the quartz by argon gas. The atomizer is decomposed into atomic tin, and the high-intensity hollow cathode lamp of tin is used as an "excitation" light source to make the tin atom emit fluorescence, and the fluorescence of tin is strong. The degree is proportional to the concentration of tin within a certain range. Determination of the fluorescence intensity of tin by atomic fluorescence spectrometry, based on atomic fluorescence intensity Calculate the tin content in the sample.

## 4 Reagents or materials

This section uses analytically pure reagents and secondary water in accordance with GB/T 6682, unless otherwise stated.

4.1 sodium peroxide.

4.2 Sodium hydroxide solution.  $\rho=250\text{g/L}$ .

4.3 Hydrochloric acid solution (1 1). excellent grade pure.

4.4 Nitric acid solution (1 1).

4.5 Nitric acid solution (1 4).

4.6 Sulfuric acid solution (1 1). Warning - improper dilution is dangerous