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

GB/T 14352.19-2021

**Methods for chemical analysis of tungsten ores and molybdenum ores - Part 19:
Determination of bismuth, cadmium, cobalt, copper, iron, lithium, nickel, phosphorus,
lead, strontium, vanadium and zinc content - Inductive-coupled plasma atomic emission
spectrophotometry (I)**

钨矿石、钼矿石化学分析方法 第19部分：铋、镉、钴、铜、铁、锂、镍、磷、铅、
锶、钒和锌量的测定 电感耦合等离子体原子发射光谱法

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Foreword

GB/T 14352 "Methods for Chemical Analysis of Tungsten Ore and Molybdenum Ore" has 22 parts, including 25 chemical analyses of 34 elements method.

- 1.Determination of tungsten content;
- 2.Determination of the amount of molybdenum;
- 3.Determination of copper content;
- 4.Determination of lead content;
- 5.Determination of zinc content;
- 6.Determination of cadmium content;
- 7.Determination of the amount of cobalt;

- 8.Determination of nickel content;
- 9.Determination of Sulfur Content;
- 10.Determination of arsenic content;
- 11.Determination of the amount of bismuth;
- 12.Determination of silver content;
- 13.Determination of tin content;

1 Scope

GB/T 14352.19-2021 is the Chinese national standard on methods for chemical analysis of tungsten ores and molybdenum ores - part 19: determination of bismuth, cadmium, cobalt, copper, iron, lithium, nickel, phosphorus, lead, strontium, vanadium and zinc content - inductive-coupled plasma atomic emission spectrophotometry (i, 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 9 March 2021 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 October 2021. 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 14352 specifies the determination of bismuth, cadmium, cobalt, and cobalt in tungsten ores and molybdenum ores by inductively coupled plasma atomic emission spectrometry. Copper, iron, lithium, nickel, phosphorus, lead, strontium, vanadium and zinc content. This part is applicable to inductively coupled plasma with bismuth, cadmium, cobalt, copper, iron, lithium, nickel, phosphorus, lead, strontium, vanadium and zinc content in tungsten ores and molybdenum ores Simultaneous determination by atomic emission spectrometry. The detection limits and measurement ranges of each element of this method are shown in Table 1. Table

1 The detection limit and measurement range of each element are in micrograms per gram.
 Element detection limit detection range Element detection limit detection range
 Bismuth 18.8 60~10000 Nickel 2.7 25~1250 Cadmium 1.42 10~2500 Phosphorus 8.3 30~7500
 Cobalt 1.43 10~2500 Lead 17.9 60~7500 Copper 5.88 30~20000 Strontium 2.23 10~2500
 Iron a 0.012 0.04~

10 Vanadium 7.32 30~6250 Lithium 1.49 10~2500 Zinc 8.27 30~6250 a The iron content is expressed in %.

2 Normative references

The following documents are indispensable for the application of this document. For dated reference documents, only the dated version applies to this article. 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

GB/T 14505 General rules and general regulations of rock and ore chemical analysis methods

3 Principle

The sample is dissolved in hydrochloric acid, nitric acid, hydrofluoric acid and perchloric acid to prepare a sample solution. Using inductively coupled plasma as an ion source, After the product solution is introduced into the atomization system by the carrier gas (argon) for atomization, it enters the axial channel of the plasma in the form of aerosol. The atmosphere is fully evaporated, atomized, ionized and excited, emitting the characteristic spectral lines of the contained elements. According to the intensity of the characteristic spectrum, the calibration curve is used. The linear method quantitatively determines the mass fraction of the analytical elements in the solution.