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

GB/T 11848.12-2025

Replacing GB/T 11848.12-1999

**Methods for analysis of uranium ore concentrate - Part 12:
Determination of boron - Inductively coupled plasma mass
spectrometry**

铀矿石浓缩物分析方法 第12部分：硼的测定 电感耦合等离子体质谱法

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents". Drafting. This document is Part 12 of GB/T 11848, "Analytical Methods for Uranium Ore Concentrates". GB/T 11848 has the following parts published.

- 1. Determination of Uranium by Ferrous Sulfate Reduction-Potassium Dichromate Titration;
- 2. Determination of Nitric Acid-Insoluble Uranium by Spectrophotometry;
- 3. Gravimetric determination of extractable organic compounds;
- 4. Determination of Arsenic and Mercury by Hydride Generation-Atomic Fluorescence Spectrometry;
- 5. Determination of Carbonate by Infrared Absorption Spectroscopy;
- 6. Determination of Fluorine by Ion-Selective Electrode Method;
- 7. Determination of Halogens - Volhard Method;
- 8. Determination of Moisture Content by Gravimetric Method;
- 9. Determination of Silicon by Spectrophotometry;
- 10. Determination of Sulfur by Infrared Absorption Spectroscopy;
- 11. Determination of Thorium by Inductively Coupled Plasma Mass Spectrometry;
- 12. Determination of Boron by Inductively Coupled Plasma Mass Spectrometry;

1 Scope

GB/T 11848.12-2025 is the Chinese national standard on methods for analysis of uranium ore concentrate - part 12: determination of boron - inductively coupled plasma mass spectrometry, in the field of energy and heat transfer engineering. 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 5 October 2025 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 May 2026. Classification: ICS 27.120.30, CCS F46. 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 document describes a method for determining boron in uranium ore concentrates. This document applies to the determination of boron in uranium ore concentrates. Determination range. 0.00100%~0.250%.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 6682 Specifications and test methods for water used in analytical laboratories

GB/T 10268 Uranium Ore Concentrates

3 Terms and Definitions

The terms and definitions defined in GB/T 10268 apply to this document.

4.Principles The sample was dissolved by heating with concentrated nitric acid and hydrogen peroxide. Uranium was then separated using CL-TBP extraction resin in a 3 mol/L nitric acid medium. Under the selected instrument measurement conditions, the sample was introduced via nebulization, and 10^3Rh was used as an internal standard to correct instrument signal drift. Inductively coupled plasma mass spectrometry was then employed. The boron content was determined by a method.

5.Reagents or materials Unless otherwise specified, only electronically pure reagents were used in the analysis. The water used in the experiments met the Class I standard as specified in GB/T 6682.

5.1 Hydrofluoric acid, $\rho=1.15\text{g/mL}$.

5.2 Hydrogen peroxide, $\rho=1.11\text{g/mL}$, analytical grade.

5.3 Nitric acid, $\rho=1.42\text{g/mL}$.

5.4 Nitric acid solution, $c=3\text{mol/L}$. Measure 400mL of water into a volumetric flask, add 100mL of nitric acid (5.3), and shake well to prepare the solution.

12 Determination of Boron Inductively Coupled Plasma Mass Spectrometry Warning

---Personnel using this document should have practical experience working in a formal laboratory. This document does not cover all possible safety issues. Users are responsible for taking appropriate safety and health precautions and ensuring compliance with relevant national regulations. This document relates to... Toxic and hazardous waste should be collected and stored centrally, and the responsibility for various types of waste should be strictly implemented in accordance with the relevant regulations and technical indicators of the national environmental protection administration. Responsibility should be handled centrally.