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

GB/T 17672-2025

Replacing GB/T 17672-1999

**Determinations for isotopes of lead, strontium and neodymium
in rock samples**

岩石中铅、锶、钕同位素测量方法

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Foreword

This document conforms to GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents". Drafting is scheduled. This document supersedes GB/T 17672-1999 "Methods for the Determination of Lead, Strontium and Neodymium Isotopes in Rocks" and is consistent with GB/T 17672-1999. Aside from structural adjustments and editorial changes, the main technical changes are as follows: --The fractionation calibration formula was changed from the original linear calibration to an exponential model mass fractionation formula (see Chapter 10, 1999). Chapter 7 of the edition); --The size of the lead separation exchange column was changed, a smaller exchange column was used, the amount of reagent used was reduced, and the overall background of the process was lowered (see...). 7.9 (

3.16 in the 1999 edition). --The method for separating neodymium was changed to use P507 resin, avoiding the need for precise pH control in the preparation of alpha-hydroxyisobutyric acid. The determination method is simpler (see 9.6,

6.6 in the 1999 edition). --The sample digestion steps have been refined, and digestion methods for different minerals have been added (see Appendix A). Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed and is under the jurisdiction of the National Nuclear Energy Standardization Technical Committee (SAC/TC 58). This document was drafted by: Beijing Research Institute of Geology, Nuclear Industry Standardization Institute, and Research Institute of Geology and Geophysics, Chinese Academy of Sciences. Institute, China National Institute of Metrology. The main drafters of this document are. Yan Yan, Cui Jianyong, Zhang Tianrui, Xin Xiaoying, Wang Ying, Chu Zhuoyin, Song Panshu, Wang Xinyu, and Zheng Jijia. The release history of this document and the document it replaces is as follows: --First published in 1999 as GB/T 17672-1999; --This is the first revision. Methods for measuring lead, strontium, and neodymium isotopes in rocks Warning - Users of this document should have prior experience working in a formal laboratory setting. This document does not cover all

possible safety precautions. Problem. Users are responsible for taking appropriate safety and health measures and ensuring compliance with relevant national regulations.

1 Scope

GB/T 17672-2025 is the Chinese national standard on determinations for isotopes of lead, strontium and neodymium in rock samples, 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 February 2026. Classification: ICS 27.120.30, CCS D45. 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 specifies the test conditions, reagents or materials, and instruments and equipment for the determination of lead, strontium, and neodymium isotopes in rock samples by thermal ionization mass spectrometry. The content includes samples, test procedures, test data processing, repeatability and uncertainty, and quality assurance and control. This document applies to the determination of lead, strontium, and neodymium isotopes in rock and mineral samples.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are listed below. 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 6041 General Rules for Mass Spectrometry Analysis

GB/T 25915.1 Cleanrooms and related controlled environments - Part

3 Terms and Definitions

This document does not contain any terms or definitions that need to be defined.

4. Principles After sample digestion, lead was separated from the effluent using anion exchange resin in a hydrobromic acid system, and lead was separated from the effluent using cation exchange resin. Strontium and total rare earth elements were extracted, and neodymium was then separated from the total rare earth elements using CL-P507

extraction resin. Lead, strontium, and neodymium isotopes were determined using thermal ionization mass spectrometry.

5 Test conditions

5.1 The test conditions such as temperature and humidity during thermal ionization mass spectrometry testing shall meet the relevant requirements of GB/T 6041 and JJF 1120.

5.2 Sample pretreatment shall be carried out in a chemical cleanroom, and the cleanliness of the laboratory shall meet ISO Class 6 of GB/T 25915.1. Relevant requirements.

6. Reagents or materials Unless otherwise stated, all acid reagents used in the analysis are MOS grade and were prepared by purification using a sub-boiling distillation acid purifier. The water used for testing was high-purity water with a resistivity $\geq$