

ICS 73.020

CCS D14



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

GB/T 13071-2010

Replacing GB/T 13071-1991

**Geological waters samples - Determination of radioactive ratios
234U/238U and 230Th/232Th - Extraction chromatograph and
alpha spectrometry measure**

地质水样 234U/238U、230Th/232Th 放射性活度比值的测定 - 萃淋树脂萃取色
层分离 α 能谱法

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Standardization Administration of China**

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Foreword

This standard replaces GB/T 13071-1991 "geological water samples 234U/238U, determination of 230Th/232Th ratio of radioactivity." This standard compared with GB/T 13071-1991, the main changes are as follows:

- A standard specification title;
- Increased alert, warnings;
- Provision increases the processing of waste;
- Deleted directory;
- Simplifies the measuring instruments;
- Corrected some errors. The standard proposed by the People's Republic of China Ministry of Land Resources. This standard by the National Standardization Technical Committee of Land and Resources. This standard is drafted by: National Geological Experimental Test Center. This standard was drafted. Nuclear Industry Beijing Institute of Geology. The main drafters of this standard. Wu Zhaohui, Li-kun. This standard replaces the standards previously issued as follows:
 - GB/T 13071-1991. Geological water samples 234U/238U, 230Th/232Th Determination of the ratio of radioactivity Levextrel extraction chromatography alpha spectroscopy Warning
 - personnel should use this standard practice regular laboratory work. This standard does not point out all possible security asked question. Users have the responsibility to take appropriate safety and health practices and to ensure compliance with the conditions relevant national regulations.

1 Scope

GB/T 13071-2010 is the Chinese national standard on geological waters samples -

determination of radioactive ratios $^{234}\text{U}/^{238}\text{U}$ and $^{230}\text{Th}/^{232}\text{Th}$ - extraction chromatograph and alpha spectrometry measure, 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 10 November 2010 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 February 2011. Classification: ICS 73.020, CCS D14. 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 standard specifies the P350 extraction resin extraction chromatography alpha spectroscopy and CL-TBP extraction resin extraction chromatography alpha spectroscopy measurements 5L given geological water samples $^{234}\text{U}/^{238}\text{U}$, $^{230}\text{Th}/^{232}\text{Th}$ radioactivity ratio method. This standard applies to 5L geological water samples $^{234}\text{U}/^{238}\text{U}$, $^{230}\text{Th}/^{232}\text{Th}$ ratio of radioactivity measured. For 5L environmental water samples The $^{234}\text{U}/^{238}\text{U}$, $^{230}\text{Th}/^{232}\text{Th}$ radioactivity can be measured with reference to the ratio of use. Measuring range. Uranium. greater than $1.23 \times 10^{-3}\text{Bq/L}$; Th. greater than $1.23 \times 10^{-3}\text{Bq/L}$; $^{230}\text{Th}/^{232}\text{Th}$. not more than 15.

2 Normative references

The following documents contain provisions which, through this standard reference and become the standard terms. For dated references, all subsequent Revision < not including the contents of errata> or revisions do not apply to this standard, however, encourage the parties to study under this agreement is standard Whether the latest versions of these documents. For undated reference documents, the latest versions apply to this standard.

GB/T 6379 (all parts) of measurement methods and results Accuracy (trueness and precision)

GB 9133 Classification of radioactive waste

GB 14500 radioactive waste management 3 P350 Levextrel extraction chromatography alpha spectroscopy

3.1 Principle A certain volume of water samples, after adding acidified with nitric acid. Carrier added ferric chloride and ammonium chloride, pH was adjusted with ammonia, uranium, thorium and enriched with hydrogen Oxide form precipitation. The precipitate was dissolved with concentrated nitric acid to prepare a solution to the column, through the P350 extraction chromatographic column, separated from other interfering elements, Purification of uranium and thorium. With hydrochloric acid elution thorium, uranium and then eluted with sodium fluoride. Electrodeposition process for producing thorium and

uranium alpha source. Respectively alpha spectrometer The measurement of uranium and thorium isotopes alpha spectrum curve, and calculated the ratio.

3.2 Reagents Unless otherwise stated in this section, both in the analysis using analytical grade and distilled water or equivalent purity water in line with national standards.

3.2.1 ammonium oxalate.

3.2.2 ammonium chloride.

3.2.3 of aluminum nitrate $[\text{Al}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}]$.

3.2.4 tartaric acid.

3.2.5 ammonia ($\rho=0.91\text{g/mL}$).

3.2.6 nitrate ($\rho=1.42\text{g/mL}$).

3.2.7 hydrofluoric acid.