

ICS 73.020

CCS D14



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

GB/T 13072-2010

Replacing GB/T 13072-1991

**Geological water samples - Determination of radioactive ratio
226Ra/228Ra - Emanation - beta counting techniques**

地质水样 226Ra/228Ra 放射性活度比值测定 射气法 - β 法

Issued on: November 10, 2010

Implemented on: February 1, 2011

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China;
Standardization Administration of China**

Table of Contents

- 1 Scope
- 2 Normative references
- 4 Reagents

Foreword

This standard replaces GB/T 13072-1991 "geological water samples activity ratio analysis 226Ra/228Ra of." This standard compared with GB/T 13072-1991, 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 13072-1991. Geological water samples 226Ra/228Ra radioactivity Ratio determination emanation method -beta law 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 13072-2010 is the Chinese national standard on geological water samples - determination of radioactive ratio 226ra/228ra - emanation - beta counting techniques, 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 method for the analysis of geological water samples $^{226}\text{Ra}/^{228}\text{Ra}$ ratio of radioactivity, which, ^{226}Ra measured by emanation, ^{228}Ra ^{228}Ac measured on a low background beta by means of its daughter. This standard applies to surface water, groundwater, uranium and uranium mine water plant Wastewater $^{226}\text{Ra}/^{228}\text{Ra}$ radioactivity ratio analysis, environmental Sewage, water and solid samples after appropriate treatment can also refer to use. Measuring range. ^{226}Ra specific activity $> 3.6 \times 10^{-3}\text{Bq/L}$ and ^{228}Ra specific activity $> 3.5 \times 10^{-3}\text{Bq/L}$ or more of a variety of ratios.

2 Normative references

The following documents contain provisions which, through this standard reference and become the standard terms. For dated references, all subsequent Modified version (not including errata content) 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 Principle 3 5L acidified water samples with lead sulfate, barium, radium co-precipitation and dissolved with disodium edetate (EDTA disodium), filtered to Insoluble debris re-use sulfate precipitate was dissolved with diethyl be sub-pentaacetic acid (DTPA, $\text{C}_{14}\text{H}_{23}\text{N}_3\text{O}_{10}$) after ^{228}Ac grow again As sulfate precipitation, the precursor ^{226}Ra and ^{228}Ac separate solution of the ester (P204, $\text{C}_{16}\text{H}_{35}\text{O}_4\text{P}$) and extracted with di (2-ethylhexyl), anti-nitrate Extraction, cerium oxalate precipitate source system, measuring ^{228}Ac , and the standard comparison solution at low background beta means, including the degree of ^{228}Ac get, and then converted into ^{228}Ra activity. Sulfate precipitate was dissolved with disodium edetate charged diffuser. It closed a few days later by emanation and measurement ^{226}Ra Comparison of standard solutions obtained radium ^{226}Ra activity, the final calculation of ^{226}Ra and ^{228}Ra radioactivity ratio.

4 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.

4.2 absolute ethanol (ρ 0.78g/mL).

4.3 hydrochloride (ρ 1.19g/mL).

4.4 hydrochloric acid solution (12).

4.5 nitric acid solution (114).

4.6 sulfuric acid solution (11).

4.7 Sodium hydroxide solution (100g/L). 100g of sodium hydroxide dissolved in water, diluted to 1000mL.

4.8 ammonia solution (12).