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**(U-Th)/He isotope determination and age calculation method of
apatite and zircon**

磷灰石和锆石铀、钍、氦同位素测定与年龄计算方法

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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.

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

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This document was drafted by: Wuxi Petroleum Geology Research Institute, Petroleum Exploration and Development Research Institute of China Petroleum & Chemical Corporation, and China Geological Survey.

Institute of Geology, Chinese Academy of Sciences; Institute of Geology, China Earthquake Administration; China University of Petroleum (Beijing); Exploration Department of China National Petroleum Corporation Development Research Institute, Institute of Geology and Geophysics, Chinese Academy of Sciences, Oil and Gas Resources Survey Center, China

Geological Survey, China National Petroleum Corporation Hangzhou Geological Research Institute, a joint-stock company.

The main drafters of this document are: Wang Jie, Wang Ping, Ma Liangbang, Hu Zongquan, Chen Wen, Wang Ying, Chang Jian, Ren Rong, Tao Cheng, Wu Lin, and Sun Jingbo.

Tengger, Dong Qingwei, Liang Feng.

Apatite and zircon uranium, thorium, and helium isotope determination and Age calculation method

1 Scope

This document describes the methods for determining uranium, thorium, and helium isotopes and calculating ages of apatite and zircon, and specifies the corresponding quality requirements.

This document applies to the determination and age calculation of uranium, thorium, and helium isotopes in apatite and zircon.

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.

SY/T 6336 Methods for the Separation and Identification of Heavy Minerals in Sedimentary Rocks

3 Terms and Definitions

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

4 Instruments and Equipment

4.1 Belt-type electromagnetic mineral separator. magnetic field strength 17000Gs~20000Gs; motor power 1.1kW~1.5kW; rotation speed 22r/min~40r/min.

4.2 Stereo microscope. with a magnification of 80x or greater, and equipped with a reflected light system, a transmitted light system, a measurement and imaging system.

4.3 Laser Helium Release Analyzer. Quadrupole mass spectrometer mass number scanning range 1 amu to 100 amu; electron multiplier operating voltage greater than or

equal to...

At 800V; vacuum system vacuum degree less than or equal to 2.0×10^{-6} Pa; diode laser wavelength 970nm, with lens focusing system; sample The tasting room features sapphire windows.

4.4 Inductively Coupled Plasma Mass Spectrometer. Mass number scanning range 5 amu to 250 amu; minimum resolution at 1 amu peak at 5% peak height.

Wide; atomizer flow rate less than or equal to 100 μ L/min.

4.5 Ultrasonic cleaner. vibration frequency 40kHz~100kHz.

4.6 Oven. Maximum temperature $300^{\circ}\text{C} \pm 2^{\circ}\text{C}$.

4.7 Electric heating plate. power 1000W~3000W.

4.8 Erlenmeyer flasks. 1.5mL~2.0mL, polytetrafluoroethylene or polypropylene, with screw caps. 4.9 Funnel. 1000mL.

4.10 High-pressure digestion vessel. volume less than or equal to 125 mL; working pressure greater than or equal to 12 MPa; working temperature greater than or equal to...

250°C ; Inner tank material. polytetrafluoroethylene.

4.11 Sample dissolution vial. 350 μ L, polytetrafluoroethylene, with cap.

4.12 Pipettes. 10 μ L~100 μ L, 100 μ L~1000 μ L, 1mL~10mL.