ICS 71.040.99
CCS G 04

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 45468-2025

Microbeam analysis - FIB-SEM imaging and analysis method for 3D micro-pore structure of rock sample

微束分析 岩石微孔隙聚焦离子束-扫描电镜三维成像分析方法

Issued on: March 28, 2025 **Implemented on: October 1, 2025**

Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents.

This document was proposed and coordinated by the National Microbeam Analysis Standardization Technical Committee (SAC/TC38).

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Microbeam analysis of rock micropores Focused ion beam-scanning Electron Microscope Three-Dimensional Imaging Analysis Method

1 Scope

This document specifies a method for three-dimensional imaging of microporosity in dense rocks using focused ion beam-scanning electron microscopy.

This document is applicable to micro-nano pores of 50nm~20μm in rocks such as mudstone, shale, dense carbonate rock, dense sandstone and coal rock.

Analysis of other geological samples shall be carried out in the same manner.

2 Normative references

GB/T 23414

GB/T 27788

GB/T 38531-2020

3 Terms and definitions

Terms and definitions defined in GB/T 23414, GB/T 27788, GB/T 38531-2020 and JY/T 0583-2020 and the following Applicable to this document.

3.1 [Source. JY/T 0583-2020, 2.1, modified]

The sample surface is bombarded with a focused ion beam, and the scanning or processing trajectory, step length, and dwell time of the ion beam are controlled by a computer.

The system can reduce the time and cycle number to realize the analytical processing system for material imaging, etching, induced deposition and implantation.

3.2

Micro-nano processing and imaging instrument with FIB and scanning electron microscopy imaging system.

3.3 Confocal distance coincidence distance

The distance between the intersection point of the electron beam and the ion beam and the lower surface of the SEM objective pole piece.

[Source. JY/T 0583-2020, 2.8, modified]

3.4 Gas injection system gasinjectionsystem;GIS

A system used to inject a certain gas into the sample surface to assist in material deposition and enhance etching function.

[Source. JY/T 0583-2020, 2.6, modified]