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99Tc 在北山花岗岩裂隙中的迁移行为研究

摘要

围岩多尺度裂隙及其核素迁移机理的揭示和模拟是核废料地质处置安全保障前提，锝-99 作为长寿命核素，迁移能力强，是处置库安全评价的关键核素。通过锝-99 在花岗岩裂隙系统的迁移扩散实验，阐明裂隙中裂隙填充物及胶体的形成规律、赋存特征及其与核素的相互作用机制，定量评估其对低溶解度、强吸附性核素迁移的影响，为高放废物地质处置库安全评价和长期安全性预测提供理论与工程依据。

关键词

1. 围岩多尺度裂隙 2. 核素迁移机理 3. 锝-99

Abstract

The revelation and simulation of multi-scale fractures in surrounding rock and radionuclide migration mechanisms are the prerequisite for the safety guarantee of nuclear waste geological disposal. As a long-lived radionuclide, Technetium-99 features strong migration capacity and serves as the critical nuclide for repository safety assessment. Through migration and diffusion experiments of Technetium-99 in granite fracture systems, this study clarifies the formation rule and occurrence characteristics of fracture fillings and colloids in fractures, as well as their interaction mechanisms with radionuclides. It quantitatively evaluates their impacts on the migration of radionuclides with low solubility and strong adsorption, providing theoretical and engineering references for the safety assessment and long-term safety prediction of high-level radioactive waste geological repositories

Keywords

1.multi-scale fractures of surrounding rock 2.radionuclide migration mechanism 3.Technetium-99 (Tc-99)

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