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Retention of radionuclides in a fracture infill

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The EURAD European Joint Project (www.ejp-eurad.eu) is a European project supported by the European Commission via the Horizon 2020 framework programme. WP 5: Fundamental understanding of radionuclide retention (FUTURE) concerns the quantification of the long-term retention of key radionuclides in solid phases aimed at developing models of reactive transport in the host rock in close cooperation with the Development and improvement of numerical methods (DONUT) WP. The Mobility of radionuclides in crystalline rock Task of the WP is aimed at the observation of the retention of DGR-relevant radionuclides in a crystalline host rock fracture filling and the evaluation of its contribution to the safety function of the crystalline host rock. A calcite fracture filling, nickel as the radionuclide of interest and caesium as the reference radionuclide were selected so as to allow for the study of sorption processes in the crystalline fracture environment. Samples of a natural calcite fissure infill and migmatite host rock extracted from the Bukov URF, Czech Republic, were distributed to the various project partners for experimental research purposes. Batch sorption experiments were subsequently performed on both materials using Ni, Cs and other elements in synthetic ground water and CaCl₂ for the calcite. The results of Ni sorption on natural calcite revealed a lower level of retention than that of the surrounding host rock (migmatite).