

RAMPEC: A WORKPACKAGE IN EURAD-2 FOCUSING ON RADIONUCLIDE MOBILITY UNDER PERTURBED CONDITIONS

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In this contribution, the Workpackage RAMPEC (radionuclide mobility under perturbed conditions) in EURAD-2 will be presented. RAMPEC is investigating different aspects of radionuclide mobility with the aim of improving the predictive capacity of models for disposal system chemistry and radionuclide mobility under perturbed (saline, organic or hyperalkaline) conditions, based on a combination of new experimental and modelling studies up to the cell scale. RAMPEC is projected to have a 5 year duration (2024-2029) and is performed by a group of 31 beneficiaries.

Good understanding of radionuclide (RN) behaviour in argillaceous, crystalline and cementitious systems under equilibrium conditions has been derived from past experimental studies in simplified reference systems. Radionuclide and gas behaviour under perturbed conditions, however, are poorly constrained and to date there is no integral model-based description for perturbed systems. In addition, the capability of describing the chemical evolution of in-situ conditions in such systems has not yet reached a necessary level of maturity to deliver deterministic predictive reactive transport modelling of the nearfield. RAMPEC will provide improved methods and approaches both regarding mechanistic modelling of radionuclide retention and migration on the disposal cell scale (meter to decametre scale). This will be achieved by the use of existing data from previous projects (FUTURE, CORI, ...) and targeted new experimental investigations. All R&D Tasks aim for both scientific excellence and high relevance in the applied context. RAMPEC is restricted to three systems (clay, granite, cement) with a limited number of specific perturbations relevant to each system to be investigated. Apart from Task 1 (management/coordination) and Task 2 (knowledge management), in which activities in RAMPEC pertaining to a retention/transport parameters database (RTP-D) are included, the RD&D oriented Tasks in RAMPEC are Task 3 (experimental program, with Subtasks focusing on experimental studies in the clay, granite and cement systems), Task 4 (development of macroscopic/mechanistic models) and Task 5 (upscaling of data and models – benchmarking). RAMPEC will establish an End-User Group at WP level, and will allow for broad international cooperation throughout Europe with excellent opportunities for education and training, as well as sharing of resources and expertise.

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