

Transport Model for the Behaviour of Nuclear Wastes in Salt Stocks

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Abstract

For performance assessment of underground disposal sites for radioactive waste it is essential to assess the maximum likely mass transfer of radionuclides into the geosphere and hence into the biosphere. Specially developed transport programs have been coupled with CHEMAPP to calculate the solubility of various radionuclide-bearing solid phases. Two scenarios were considered: transport in a system of caverns in salt rock (saturated salt solutions) and diffusional transport in a clayey environment (low-salinar solutions). A third application deals not yet with radionuclide transport: GRS explores into a novel sealing material for boreholes in saltrock (which eventually could bear radioactive waste).

This material is based on anhydrous $MgSO_4$, which upon reaction with saturated $NaCl$ -solution reacts to a virtually unpenetrable barrier for aqueous solutions. Transport of solution into this seal and the concomitant reactions are also successfully modelled with ChemApp. In the presentation first results are presented.