Experimental study on the thermo- and hydro- properties of two bentonites as buffer materials

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This study aims at investigating the hydraulic and thermal properties which are important for buffer materials to be used for geological disposal of high-level radioactive wastes. MX-80 bentonite and Kunigel V1 bentonite, originated from Wyoming USA and Japan, respectively, were used in the experimental program. The characteristics of these 2 bentonites, including soil-water characteristic curve, swelling pressure, hydraulic conductivity, and thermal conductivity were determined in the laboratory. And these data are applied in the simulation of the resaturation processes of buffer material in a deposition hole, such that a comparison can be made on the thermo-hydro-mechanical coupling effects of the buffer material can be evaluated. It is found that the two bentonites do not behave very differently in terms of the moisture distribution and heat transfer characteristics with the same boundary conditions assumed.