

Effects of salinity on diffusivities of Sr²⁺ and I-ions in compacted bentonite

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In order to investigate the effects of salinity on diffusivities in compacted sodium-bentonite, the thorough-diffusion experiments of Sr²⁺ and I- ions were performed at 298K. Highly purified bentonite was compacted to a dry bulk density of 0.9 Mg/m³ and then saturated with 0.01 to 0.5M NaCl solutions. Effective diffusion coefficients, D_e of I- ion increased from 1.0×10^{-11} m²/s (0.01M NaCl) to 5.3×10^{-11} m²/s (0.5M), while those of Sr²⁺ ion also increased from 1.3×10^{-13} m²/s (0.01M NaCl) to 2.2×10^{-11} m²/s (0.5M). Changes in the diffusivities of the both ions can be attributed to changes in microstructure and/or sorptivity of bentonite as a function of salinity. The both ions are interpreted as diffusing through porewater among clay stacks.

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