# Salinity Dependence of Apparent Diffusion Coefficients of Selenite, Selenate, Molybdate and Iodate in Compacted Bentnite

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The apparent diffusion coefficients of oxyanions such as selenite, selenate, molybdeate and iodate in Japanese bentonites were investigated in various salinity, because the waste including a great deal of salinity occurred by Fukushima dai-ichi accident.

The apparent diffusion coefficients of oxyanions tended to decrease with increase of dry density and content of montmorillonite of bentonite and be increased by the salinity. This is explained by a change in porosity as diffusion path. Furthermore, effective porosity for diffusion becomes small by anion exclusion of the negatively charged montmorillonite. Anion accessible porosity was calculated by left out the interlayer porosity [1]. The apparent diffusion coefficients of oxyanions are plotted as a function of anion accesible porosity in figure below. The apparent diffusion coefficient would be explained by Archie's law [2] and is proportional to exponentiation of anion accesible porosity. Selenite has larger apparent diffusion coefficient than those of other anions becouse the stokes radius of selenite is larger than others.
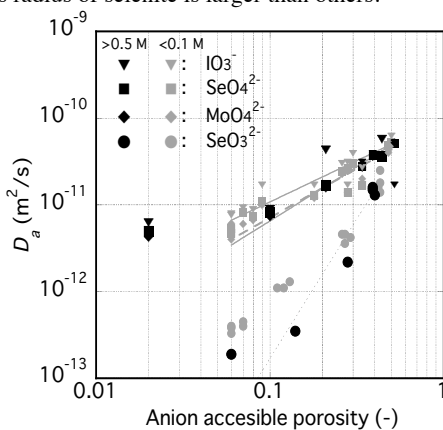
Figure 1: Apparent diffusion coefficients of oxyanions as a function of anion accesible porosity.

[1] Idemitsu et al. (2015) Progress in Nuclear Energy doi:10.1016. [2] Archie (1942) Trans. Am. Mech. Eng. **146**, 54-67. [4]