# Delay effect of ionic diffusivity in nanopores of geomaterials

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In the non-deformed homogeneous rock, the mass transfer property depends primary on porosity as the following De-porosity power law as,

De= 0.83 x p^2.8 x D0

where De is the effective diffusion coefficient, D0 denotes the molecular diffusion coefficient and p is the porosity. For the samlpes with abundant nanopore (<100nm), however, the diffusion coefficient seems to be lower than is expected from the above relation. This results from the delay effect by nanopores which have the highly constrained structures of hydrogen-bonded H2O molecules in restricted pore spaces. The diffusion coefficient within nanopores can be estimated as the following,

1.38 x 10-10 ~ 2.78 x 10-10 m2/s.