

Permeability variation of Fontainebleau sandstones associated with solution composition

Takashi Nakajima[1]; Tadashi Yokoyama[2]; Tetsuro Hirono[3]; Satoru Nakashima[4]

[1] Earth and Space Science, Osaka Univ.

; [2] Dept. Earth and Space Science, Univ. Osaka; [3] Osaka Univ.; [4] Dept. Earth & Space Sci., Osaka Univ.

Permeability is an important basic physical property controlling material transport in various geodynamic processes such as volcanic eruption, earthquake generation, resource accumulation, and environmental pollution. Permeability of fluids in diverse rocks has been measured essentially for pure water. However, natural geo-fluids have varying pH and chemical compositions. Therefore, this study focuses on the effect of solution composition on water permeability.

A water permeameter has been constructed based on a simple gas permeameter of Takeuchi and Nakashima (2005). By applying a constant water head, solution flux was measured. Permeabilities of pure water, NaCl and Na₂CO₃ solutions are determined on sandstones. In addition, four Fontainebleau sandstones with varying porosity were examined for permeability changes with porosity for different aqueous solutions.