

The peculiarities of clayey rock swelling in electrolyte solutions

Khramchenkov M., Khramchenkov E., Petrukha V.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

Osmotic pressure in swelling clay rock depends on the type and concentration of the pore solution. At zero concentration of the pore solution osmotic pressure is generated by ions-compensators negative electric charge of clay particles. Last is the cause of heterovalent substitution of iron ions in the octahedral sites and silicon ions in tetrahedral sites. If the osmotic pressure is balanced by the external pressure on the osmotic system, the latter starts to swell. The presence of electrolytes in the water changes the magnitude of the osmotic pressure in the clayey rock. The dependence of the concentration of the osmotic pressure of the solution is rather complex, therefore at different solution concentrations swelling of clayey rocks proceeds differently.

Keywords

Deformations, Electrolyte solution, Osmotic pressure, Swelling