

## Laboratory experiments on streaming potential under high temperature (2)

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In order to estimate electrokinetic coupling coefficient under high temperature crustal conditions, laboratory experiments were carried out. A granite rock sample (3cm in diameter, 5cm in length) covered with insulating jacket was set within a vessel of temperatures from 20 C to 200 C and pressure of 80 bars. After pore fluid of KCL solution with concentrations from 0.001 to 0.1 mol/liter (50 bars in pore pressure) is introduced, sinusoidal pressure signal is added to one end of the sample, and streaming potential generated between the two ends of the sample is measured using platinum electrodes. The results show that the observed coupling coefficients agree with the theoretical values in the range of high KCL concentrations.

In order to estimate electrokinetic coupling coefficient under high temperature crustal conditions, laboratory experiments were carried out. First, a cylindrical rock sample (3cm in diameter, 5cm in length) covered with insulating jacket is set within a high temperature (up to 300 C) and high pressure (up to 250 bars) vessel. After pore fluid is introduced, the confining and pore pressure and temperature are adjusted. Then sinusoidal pressure signal is added to one end of the sample, and streaming potential generated between the two ends of the sample is measured using platinum electrodes. The zeta-potential is calculated from measured values of streaming potential and resistivity of the sample.

Preliminary experiments using granite rock sample were conducted under the following conditions: confining pressure of 80 bars, pore pressure of 50 bars, sinusoidal pressure of 3 bars, temperatures from 20 C to 200 C, pore fluid of KCL solution with concentrations from 0.001 to 0.1 mol/liter. The results show that 1) the observed coupling coefficients agree with the theoretical values in the range of high KCL concentrations, 2) the zeta-potential vary with the temperature conditions.