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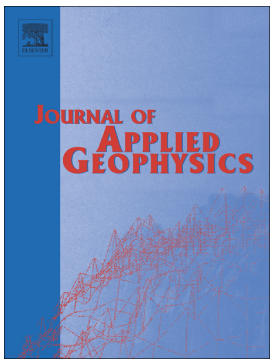

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Successive measurements of streaming potential and electroosmotic pressure with the same core-holder

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Abstract

Successive measurements of the streaming potential and electroosmotic pressure of each core sample are important for understanding the mechanisms of electrokinetic effects. In previous studies, one plug of the core-holder needs to be replaced in these two experiments, which causes the change of the fluid parameters and the boundary conditions in the core. We design a new core-holder to permit successive experiments without plug replacement, which ensures the consistency of the measurement environment. A two-direction harmonic pressure-driving source is accordingly designed. Using this new equipment, electrokinetic experiments conducted ten core samples at 0.4 mol/L NaCl solution. The results show good agreement between the electrokinetically deduced permeability and premeasured gas permeability. For high salinity saturated samples, the permeability can be inverted from electroosmotic effect instead of the streaming potential.

Keywords: streaming potential; electroosmotic pressure; electrokinetic effects; same core-holder; permeability.

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