Measuring the DC electrokinetic coupling coefficient of porous rock sample in the laboratory : a new apparatus.

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Abstract

Molecular properties of rocks allow the generation of an electric potential by the flow of an aqueous fluid through porous media. The electrokinetic potential is a key parameter in understanding the electrokinetic coupling coefficient in the study of the generation of an electric potential. This study presents a new apparatus developed to measure the electrokinetic coupling coefficient. The proposed apparatus is more accurate than currently available methods in the laboratory. This apparatus allows the measurement of the electrokinetic coupling coefficient in the laboratory by determining the difference of the potential generated by the flow of an aqueous fluid through a porous sample. The apparatus includes a new cell, a pump, a confining bulk, and an acquisition system. The electrokinetic coupling coefficient is measured by determining the difference of the potential generated by the flow of an aqueous fluid through a porous sample. The apparatus allows the measurement of the electrokinetic coupling coefficient in the laboratory and can be used to study the properties of various rock samples.

III. DC measurement apparatus

- Stainless steel cell end
- Rubber sleeves
- Rock sample
- Output fluid pressure
- T-sweat connector to put pressure transducer at room pressure.
- Tie bars (3) sealing the confining chamber (polyacrylamide)
- Lower cell plate
- 3 ways swage lock valve
- Stainless steel tube
- Steel plate
- Hydraulic pump
- Inflow
- Fluid pressure sealing O-Ring
- Upper Ag/AgCl non-polarizing electrode
- Cell 4 bars
- Fluid pressure sealing O-Ring
- Upper distribution plate
- Confining pressure security valve
- 2 ways swage lock valve
- Confining pressure sealing O-Ring
- Confining pressure transducer
- Spare swage lock connector for future measurements
- Screw to drain oil bulles between the fluid input and the Electrode sealing O-Ring
- Fluid pressure sealing O-Ring
- Pump
- Acquisision card
- Computer
- Inflow
- Fluid pressure sealing O-Ring
- Upper Ag/AgCl non-polarizing electrode
- Cell 4 bars
- Fluid pressure sealing O-Ring
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- Fluid pressure sealing O-Ring
- Pump
- Acquisision card
- Computer

IV. Development, design and construction of the apparatus

The development of the new apparatus is conditioned by the necessity to obtain important information about some porous rocks. The apparatus is made of four fluids, a confining bulk and a pressure transducer. The apparatus allows the measurement of the electrokinetic coupling coefficient in the laboratory. The apparatus is made of a new cell, a pump, a confining bulk and an acquisition system. The electrokinetic coupling coefficient is measured by determining the difference of the potential generated by the flow of an aqueous fluid through a porous sample. The apparatus allows the measurement of the electrokinetic coupling coefficient in the laboratory and can be used to study the properties of various rock samples.

V. Preliminary results

This diagram shows a collection of streaming potential data for sandstones and glass beads together with preliminary data from our apparatus and from other previous studies. The data show that the streaming potential increases with increasing flow rate, and the streaming potential for sandstones and glass beads are in agreement with previous studies. The data also show that the streaming potential for sandstones and glass beads are in agreement with previous studies.

VI. Conclusion and developments

The conclusion and developments of this apparatus have required significant research and development. The theory of electrokinetics has developed over the past few decades, and it is still an active area of research. The developed apparatus includes a new cell, a pump, a confining bulk and an acquisition system. The electrokinetic coupling coefficient is measured by determining the difference of the potential generated by the flow of an aqueous fluid through a porous sample. The apparatus allows the measurement of the electrokinetic coupling coefficient in the laboratory and can be used to study the properties of various rock samples.

Bibliography