

## Bubble Formation in CO<sub>2</sub> Saturated Pore Water

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The CO<sub>2</sub> underground storage technology has been developed in all over the world recently. Injected CO<sub>2</sub> in aquifer dissolves gradually in formation water throughout long term. However, the CO<sub>2</sub> dissolved water migrate to shallower region, dissolved CO<sub>2</sub> would separate from water as a gas phase by pressure drop, and gas CO<sub>2</sub> would accumulates in the region away from the injection site. In this study, the bubble formation of CO<sub>2</sub> under high pressure was observed using sandstone sample.

High-pressure experimental system was developed in order to observe CO<sub>2</sub> bubble formation in the sample by resistivity measurement. The resistivity measurement is capable of sensitive discrimination a CO<sub>2</sub> gas phase that is an insulator from formation water which resistivity is low. The rock sample used in this experiment was Berea sandstone almost composed of the quartz. The sample has 5-cm diameter and 12-cm length. Ten electrodes and 2 reticular electrodes were set on the side and on both ends of rock sample, respectively. The imitated formation water was KCl solution adjusted the resistivity at 1.0 ohm-m. After CO<sub>2</sub> was saturated in the solution at 6 MPa, it was injected to the sandstone sample, and then the pressure was lowered gradually. The potential difference between each electrode was measured, and the resistivity was obtained.

As a result of the measurement, bubble formation in the sample was observed by resistivity increase. Obtained potential data was analyzed by inversion, and the temporary change of resistivity distribution in the sample was acquired. In the presentation, pressure condition of bubble formation and growth and rising rate of bubble will be mentioned.