

## Experiment on the degradation of casing cement due to water-wet supercritical CO<sub>2</sub>

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As one of the technique to reduce discharge of CO<sub>2</sub> causing global warming, there is Geological storage of CO<sub>2</sub>. In this technique, what CO<sub>2</sub> does not leak on the ground for a long term is important. However, degradation of casing cement of an injection well and an abandoned well by super critical CO<sub>2</sub> may cause a leak. Therefore in this study, we let cement exposure to super critical CO<sub>2</sub> and performed an experiment to observe a property change of cement.

We put the cement sample saturated with distilled water in a pressure vessel. After having put a pressure vessel in the Constant temperature tank which we set to 60 degrees Celsius, we injected CO<sub>2</sub> of 10MPa, and maintained the same temperature and pressure for two weeks. CO<sub>2</sub> is super critical state under this temperature pressure condition. After an experiment, we performed surface and sectional observation of a cement sample and measured porosity and permeability. We examined a property change of a sample and compared a result by an environmental difference.