



The Impact of CO₂-SO₂ – Brine – Reservoir Rock Interactions on Petrophysical Properties.

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In this study we evaluate the impact of impure CO₂ on possible CO₂ repositories (Buntsandstein, Stuttgart Formation). We present experimental petrophysical data of the simulated injection of pure CO₂ and CO₂ and co-contaminant SO₂ into saline aquifers under realistic pressure and temperature conditions. We investigate 6 sandstones from different German localities, representing lower and upper Triassic and lower Cretaceous sedimentary basin formations. Our long-term experimental flow assembly is designed for a maximum pressure of 600 bar at a maximum working temperature of 150°C. The internal set-ups allow for the determination of P and S wave velocities, electrical conductivity and permeability of samples of 30 mm in diameter and 60 mm in length. Long-term (several weeks) exposure experiments with pure CO₂ reveal no significant changes in the petrophysical properties (electrical resistivity, elastic wave velocity, permeability). In contrast, for the injection of CO₂ and co-contaminant SO₂ (1 vol-%) we have observed significant and irreversible changes of all monitored physical parameters.