

Abstract Submitted
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Effects of CO₂ Solubility on Density and Mineral Trapping in Saline Aquifers MOHAMMAD ALIZADEH NOMELI, AMIR RIAZ, University of Maryland College Park — We seek to characterize the thermodynamic behavior of CO₂ when stored in saline aquifers and predict how much CO₂ will be stored as mineral formations after a specific period of time. For this purpose, the PVTx model is used to simulate how temperature, pressure and salinity affect the solubility and mineral trapping of CO₂. Increasing temperature and salinity tend to lower the solubility of CO₂. It is also found that at low temperatures, the density of the ternary H₂O-CO₂-NaCl solution does not vary monotonically with pressure but displays a minimum which is proportional to salinity. At high temperatures, on the other hand, density increases monotonically with pressure and is inversely proportional to salinity. We present a model to find the dissolution and precipitation rates of minerals by taking into account the pressure, temperature, salinity and pH of the system. The model is validated with experimental data available from the literature.

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