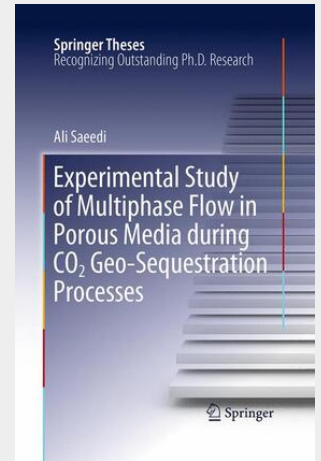


Saeedi

## Experimental Study of Multiphase Flow in Porous Media during CO<sub>2</sub> Geo-Sequestration Processes

There have been numerous computer-based simulation studies carried out on the subject of CO<sub>2</sub> geo-sequestration. However, the amount of experimental data available in the literature on this topic, especially with regards to multiphase flow characteristics of fluid-rock systems during such processes, is very limited. This research was carried out with the aim of providing a better understanding of the multiphase fluid flow characteristics of fluid-rock systems during the geo-sequestration process. The ultimate goal of this research was to experimentally evaluate the change in a number of multiphase flow characteristics of the system over time caused by the potential chemical and physical/mechanical processes occurring during deep CO<sub>2</sub> disposal. In order to achieve this goal the effects of cyclic/alternating CO<sub>2</sub>-brine flooding, flow direction, existence of residual hydrocarbon (natural gas) and change in the reservoir stress field on the system's multiphase flow behaviour were investigated. Until completion of this study there were no experimental data published in the literature addressing the above mentioned issues and the results obtained, and published within this thesis were the first of their kind.

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