



Viability of modelling gas transport in shallow injection-monitoring experiment field at Maguelone, France

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In this study, TOUGH2/EOS7CA model is used to simulate the shallow injection-monitoring experiment carried out at Maguelone, France, during 2012 and 2013. The possibility of CO₂ leakage from storage reservoir to upper layers is one of the issues that need to be addressed in CCS projects. Developing reliable monitoring techniques to detect and characterize CO₂ leakage is necessary for the safety of CO₂ storage in reservoir formations. To test and cross-validate different monitoring techniques, a series of shallow gas injection-monitoring experiments (SIMEx) has been carried out at the Maguelone. The experimental site is documented in Lofi et al [2013]. At the site, a series of nitrogen and one CO₂ injection experiment have been carried out during 2012-2013 and different monitoring techniques have been applied. The purpose of modelling is to acquire understanding of the system performance as well as to further develop and validate modelling approaches for gas transport in the shallow subsurface, against the well-controlled data sets. The preliminary simulation of the experiment including the simulation for the Nitrogen injection test in 2012 was presented in Basirat et al [2013]. In this work, the simulations represent the gaseous CO₂ distribution and dissolved CO₂ within range obtained by monitoring approaches. The Multiphase modelling in combination with geophysical monitoring can be used for process understanding of gas phase migration- and mass transfer processes resulting from gaseous CO₂ injection.

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