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# Field-scale simulations of CO2 injection in saline aquifer in north Taiwan

I-Hsien Li, Chi-Ping Lin, and Chuen-Fa Ni
National Central University, Graduate Institute of Applied Geology, Taiwan (sfdff327@gmail.com)

The carbon dioxide capture and storage (CCS) are recognized to be feasible techniques for mitigation of carbon dioxide emission for the earth environment. Due to large capacity and availability of geological formations for most countries, the geological storage methods are well-developed and many sites are on the stage for possible large-scale operations. Numerical simulations of CO2 migration in geological formations can provide key information for predicting CO2 plume, before field-scale operations and tests are conducted. This study employs TOUGH2 numerical model to predict CO2 migration in a saline aquifer (Nanchuang and Kueichulin Formations) in north Taiwan. A preprocess computer code for irregular mesh generation is developed to create input information for ECO2N module in the TOUGH2 model. The two-dimensional profile model is 20 km in length and is 2 km in depth. However, the aquifer thickness for each formation varies from hundreds to several hundreds of meters. With constant injection of 200 metric ton of CO2 in Kueichulin formation, the CO2 plumes with different phases are simulated in 2 and 20 years. Simulation results show that the distances of the CO2 plumes may move 1.2 km and 4.2 km for Nanchuang and Kueichulin formations from the injection point. The travel distances in vertical direction of CO2 plumes may reach 0.5 km(Nanchuang Formation) and 1km(Kueichulin Formation) from injection point, respectively.