『学長裁量経費による海外研究者
招聘助成』プログラム

ULB UNIVERSITÉ LIBRE DE BRUXELLES

Seminar

at L0021, Koganei-Campus, TUAT
on 9th March 13:00-14:30

Lecture Title

Effect of chemical reactions on CO_2 sequestration

Keywords:
CO_2 sequestration, chemical reactions, convective dissolution, precipitation, mineralization

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Abstract

To decrease the atmospheric concentration of CO_2, sequestration techniques whereby this greenhouse gas is injected in saline aquifers present in soils are considered. Upon contact with the aquifer, the CO_2 can dissolve in it and subsequently be mineralized via reactions with minerals like carbonates for instance. We investigate both experimentally and theoretically the influence of such reactions on the convective dissolution of CO_2 by analyzing convective patterns developing when gaseous CO_2 is put in contact with aqueous solutions of reactants in a confined vertical geometry. We show that the reactions can enhance convection inducing a more efficient sequestration [1,2,3]. In parallel, we also analyze precipitation patterns obtained when a solution of carbonate is injected into an aqueous solution of calcium ions. We show that the amount and spatio-temporal distribution of the solid calcium carbonate phase produced strongly depends on the concentrations and injection flow rate [4,5]. Emphasis will be put on the possibility to control the convective and precipitation pattern properties by varying the very nature of the chemicals. Implications on the choice of optimal sequestration sites will be discussed.

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