Contribution ID: **266** Type: **Poster Presentation**

Numerical Investigations on the Dissolution Characteristics of CO2 in Fractured Porous Media using Density Driven Modelling

Wednesday, 1 June 2022 14:50 (1h 10m)

In the present work, numerical simulation experiments were performed to examine the influence of fractures on the flow of dissolved CO2 plumes using the density driven (i.e., convective mixing) model. Porous media domain with a size of 500 m by 200 m (x-z plane) was used in the present work. The impacts of fracture aperture, fracture angle and fractures intersection on the movement of CO2 plumes have been investigated comprehensively. Single fracture scenarios with varied inclined angles and multiple fractures with horizontal, vertical, and combination of these two were examined. We found that the fractures play a vital role by serving as superior flow pathways for water and CO2 plumes. The distribution of CO2-rich fingers is comparatively even at the top boundary of the computational domain without fractures, further it is extended into the fractured area. Porous media with fractures brings an active matrix-fracture mass transfer which results in rapid CO2 dissolution. In the field-scale model, 200 fractures are randomly generated with aperture varying from 1 mm to 5 mm, and length from 5 m to 50 m. Our results demonstrate that high connectivity of fractures leads to enhancement in the dissolution of CO2 in the water.

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Time Block Preference

Time Block C (18:00-21:00 CET)

Participation

In person

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