Geochemical Modeling of CO2-Brine Gabbro-diorite Interaction for in-situ Mineral Carbonation

Buy this Content

By H. Abdoulghafour, P. Moita, E. Berrezueta, J. Pedro and J. Carneiro
Publisher: European Association of Geoscientists & Engineers
Source: Conference Proceedings, 82nd EAGE Annual Conference & Exhibition, Oct 2021, Volume 2021, p.1 - 5
DOI: (Digital Object Identifier) https://doi.org/10.3997/2214-4609.202112865

« Previous | T o C | Next »

Abstract

Summary

This work consists of a geochemical modeling applied to in situ mineral carbonation. The simulations are based on previous laboratory tests that followed 4 time sets of a plutonic mafic rock samples immersed into supercritical CO_2 – brine (8 MPa and 40°C) up to a maximum of 64-days. The study aims to mimic the experimental results; pH evolution, solution concentration changes and newly formed mineral phases. Three simulations were conducted using Crunchflow simulator, emphasizing the key role of the specific surface area on the reaction rate. The simulations corroborate the experimental results until 64-days, that is, a dominant dissolution process. Beyond the observed time, the simulation predicted the concentration breakthrough induced by secondary mineral formation. Zeolites and clay minerals are the first phase to form, competing with carbonates after 65- days. The simultaneous competition of silicate minerals to fix Calcium ions can limit carbonates formation reducing the potential for CO_2 sequestration by mineral carbonation in mafic rocks.

© EAGE Publications BV

Most Read This Month

OA The future of work in exploration: A new model to bring people, technology and data together

By Paul Genberg
pp.: 81–84 (4)

OA Tutorial: unified 1D inversion of the acoustic reflection response

Authors Evert Slob, Kees Wapenaar and Sven Treitel
pp.: 1425–1442 (18)

OA High-resolution Carina distributed acoustic fibreoptic sensor for permanent reservoir monitoring and extending the reach into subsea fields

Authors Garth Naldrett, Tom Parker, Sergey Shatalin, Michael Mondanos and Mahmoud Farhadiroushan
pp.: 71–76 (6)

OA Deep neural network application for 4D seismic inversion to changes in pressure and saturation: Optimizing the use of synthetic training datasets

Authors Gustavo Côrte, Jesper Dramsch, Hamed Amini and Colin MacBeth
pp.: 2164–2185 (22)

OA Relations between static and dynamic moduli of sedimentary rocks

By Erling Fjær
pp.: 128–139 (12)

Well Services Operations in Offshore Unmanned Platform; Challenges and Solutions

Authors O. Alyafei and J. Foster

OA Constraining basin thermal history and petroleum generation using palaeoclimate data in the Piceance Basin, Colorado

Authors Yao Tong, Daniel E. Ibarra, Jeremy K. Caves, Tapan Mukerji and Stephan A. Graham

Shallow Shear Wave Reflections: What Can the Amplitude Tell Us and How?

By Ranajit Ghose

+ More