

CERE - SEMINAR

Thursday 30 May 2024

09:15 to 10:30 a.m.

Building 229, Room 003

(Light breakfast is served from 9:00, please bring your own coffee/tea)

Online from link in calendar invitation

“Investigation of the effect of CO₂ on chalk dissolution rates by pH measurements”

By

Marc Cassiede

Abstract

Most of the oil and gas resources in Denmark are trapped in chalk sedimentary rocks, which are composed of the remains of calcareous microorganism shells [1]. As these high porosity and low permeability formations are envisioned to store CO₂ permanently, it is critical to evaluate what the impact of dissolving CO₂ in water will be on rock properties, in particular chalk dissolution/precipitation rates and rock strength. Chalk mainly consists of calcite, with lower amounts of quartz and clays. The high surface area of chalk results in a rapid release of calcium ions in the solution and thus a fast increase in pH. The incorporation of impurities such as phosphate and organic compounds during diagenesis may inhibit calcite dissolution or crystal growth. In this work, duplicated dissolution experiments were conducted on Stevns Klint outcrop chalk, North Sea reservoir chalk and pure Iceland Spar calcite. The differences in the measured calcium dissolution rates due to the presence of CO₂ and inorganic ions will be discussed.

[1] M. Hjuler, I.L. Fabricius. Journal of Petroleum Science and Engineering. 68 (2009), 151–170