

Modeling of diagenesis in carbonate rock from flow through porous media of reactive fluids

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Carbonate systems are typically very complex and heterogeneous systems with wide range of pore size and permeability because of the chemical and mechanical processes that act on them over geological time. To characterize reservoirs with carbonate rock - these processes need to be simulated with the specific boundary conditions for the actual field to be able to make better predictions.

One or more projects could be to model diagenesis in carbonate rock from flow through porous media of reactive fluids.

The attached paper describes this very well by explaining the background and concepts and results from their implementation.

Of highest interest is reflux and geothermal convection. But also hydrothermal processes where reactive fluids of high temperature flow up in open fault systems. This typically happens in rift systems with water of high magnesium content from serpentinization processes.

One chemical simulator that could be coupled with the porous media flow simulation could be PHREEQC.

References

Yitian Xiao, Gareth D Jones, Fiona F Whitaker, Anwar B Al-Helal, Sherry Stafford, Enrique Gomez-Rivas, Sean Guidry, *Fundamental approaches to dolomitization and carbonate diagenesis in different hydrogeological systems and the impact on reservoir quality distribution*, IPTC, 16579, 2013