



Multiphysics modeling of porous media acid dissolution

Stubsgaard, Aslak; Nick, Hamid

Publication date:
2019

Document Version
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

Citation (APA):
Stubsgaard, A., & Nick, H. (2019). *Multiphysics modeling of porous media acid dissolution*. Abstract from Danish Hydrocarbon Research and Technology Centre Technology Conference 2019, Kolding, Denmark.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Danish Hydrocarbon Research and Technology Centre Technology Conference 2019

Multiphysics modeling of porous media acid dissolution

A. Stubsgaard¹ and H.M. Nick¹

¹Danish Hydrocarbon Research and Technology Centre, Denmark;

A. Stubsgaard

AWF2/WPT

An OpenFOAM solver has been developed, capable of modeling buoyancy, advection, diffusion, and reaction of acid in geometries consisting of both fully fluid and heterogeneous porous media regions. Furthermore, the dissolution of porous media and with it the transition from Darcy-Forchheimer to fully fluid flow is accurately captured. With this solver, along with meshing schemes capable of constructing geometries consisting of fully fluid, porous media, and unaffected solid regions from three-dimensional CAD drawings, the impact on wormhole formation and directionality is shown to depend heavily on: Fluid properties, flow characteristics, and domain geometry. The importance of modeling three-dimensional domains, as opposed to two-dimensional domains is also observed. Full well completion models, including liner, perforations, and heterogeneous porous media, were analyzed to assess the feasibility of affecting wormhole directionality with heavy acids.

Keywords: Stimulation methods, DFN