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

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.

Danish Hydrocarbon Research and Technology Centre
Technology Conference 2019

Multiphysics modeling of porous media acid dissolution

A. Stubsgaard[1] and H.M. Nick[1]

[1]Danish 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

AARHUS UNIVERSITY UNIVERSITY OF COPENHAGEN DTU GEUS AALBORG UNIVERSITY DENMARK