



Contribution ID: 170

Type: **Poster Presentation**

3D Microscale Flow Simulation of Newtonian and Shear Thinning Fluids in Sandstone and Carbonate Samples

Wednesday, 1 June 2022 09:20 (1h 10m)

This study presents a series of 3D single-phase microscale simulations for flow of Newtonian and shear-thinning fluids through a sandstone and a carbonate samples over a range of flow velocities. Due to the requirements of multiple simulations and long computation times, the image size was chosen based on the representative elementary volume for porosity and permeability. Critical velocity was evaluated for both Newtonian and shear-thinning fluids to recognize when the flow was converted from Darcy to the non-Darcy regime. Approximately the same critical velocity was obtained for both fluids. A lower critical velocity was found for the flow of the fluids through the carbonate samples compared to the sandstone samples. The calculated Forchheimer coefficients for the fluids indicated dependencies on the rock properties and also the Forchheimer coefficient for carbonate sample is larger than the sandstone sample. Furthermore, it was found that the shift factor that expresses the relationship between the porous medium and bulk viscosities was larger for the flow of shear-thinning fluids through the carbonate samples than those in the sandstone samples.

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Iran

References

Time Block Preference

Time Block A (09:00-12:00 CET)

Participation

Online

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