Contribution ID: **436** Type: **Oral Presentation**

Dynamic pore-network modeling of coupled compositional flow and phase change dynamics in porous media

Monday, 31 May 2021 18:30 (15 minutes)

Compositional flow and phase change dynamics in porous media play a central role in many industrial and geoscience applications including fuel cells, geologic CO2 sequestration, and hydrocarbon production. Though the interplay between transient two-phase flow and phase change dynamics is of critical important, it remains not well understood limited by computational challenges especially for direct numerical simulations. We develop a novel dynamic pore-network model to simulate two-phase compositional flow and phase change dynamics in complex pore structures. The model formulation couples a thermodynamic phase-equilibrium model for multicomponent fluids in each individual pore to a dynamic pore-network model for two-phase compositional flow. The new coupled modeling framework allows us to investigate the interactions between compositional flow dynamics and phase change dynamics in highly disordered pore structures extracted from 3D digital images of rock samples. A series of example simulations of two-phase displacements show that phase change (evaporation and condensation) can suppress fingering patterns generated during invasion.

Time Block Preference

Time Block C (18:00-21:00 CET)

References

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