Contribution ID: **442** Type: **Oral Presentation**

Pore network modeling of bubble ripening in porous media

Thursday, 3 June 2021 19:00 (15 minutes)

The evolution dynamics of trapped bubble populations inside a porous medium through Ostwald ripening is relevant to several applications including CO2 sequestration, liberation of bubbles from liquid hydrocarbons, methane hydrate formation, and oxygenation of groundwater aquifers. We present a pore network model that is capable of simulating the microscopic evolution of thousands of trapped bubbles inside a porous material. The physics that govern the process include dissolution, capillary equilibrium, molecular diffusion, and geometric and topological characteristics of the confining solid. The competition between these physics leads to a rich array of macroscopic observations that are undecipherable from examining the microscopic governing equations alone. We validate the model against recent microfluidic experiments and then deploy it to predict the thermodynamic stability of trapped bubbles in heterogeneous media. Computational and algorithmic considerations key to achieve numerical stability will be highlighted.

Time Block Preference

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

References

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