Contribution ID: **630** Type: **Poster Presentation**

Modeling and simulation of reactive two mineral systems

Thursday, 25 May 2023 10:45 (1h 30m)

We set up a pore-scale model for reactive flow and transport in an evolving porous medium. We take into account dissolution/precipitation reactions of two competing minerals. The resulting space and time-dependent structural dynamics are included into the model by means of a level-set formulation.

We derive the corresponding effective model by formal two-scale asymptotic expansion. This includes dynamically changing time- and space-dependent 'effective'hydrodynamic parameters such as porosity, reactive surface, diffusion, and permeability.

We present numerical simulations with application to dissolution of calcite and dolomite of the pore-scale as well as of the effective model.

Participation

In-Person

References

Gärttner S., Frolkovič P., Knabner P., Ray N.:
Efficiency of micro-macro models for reactive two-mineral systems
Multiscale Modeling & Simulation 20
2022

DOI: 10.1137/20M1380648

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Session Classification: Poster

Track Classification: (MS09) Pore-scale modelling