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# Investigations of Degenerate Equations for Fluid Flow and Reactive Transport in Clogging Porous Media

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Structural changes of the pore space and clogging phenomena are inherent to many porous media applications. However, related mathematical investigations remain challenging due to the degeneration of the hydrodynamic parameters. In this research, we apply an appropriate scaling of the unknowns and work with porosity-weighted function spaces. This enables us to prove solvability of a coupled flow and transport problem with degenerating, but prescribed porosity field, permeability and diffusion tensor. Moreover, we conduct numerical simulations for the combined, degenerating flow and transport problem. As discretization method, lowest order mixed finite elements are used and stability of the numerical scheme is shown. Under certain additional regularity assumptions, convergence (with optimal order) can be proven. Our numerical results confirm that optimal convergence is obtained for the transformed variables whereas the non-transformed variables might not converge.

## Participation

In-Person

## References


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