APPROACHES TO MODELING UNSTABLE FLOW AND MIXING OF VARIABLE OF DENSITY FLUIDS

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ABSTRACT

Density Variation of aqueous phase fluids flowing in a porous medium, resulting from spatial and temporal variation of solute concentration, often gives rise to unstable flow, and therefore has a significant effect on solute transport. Studies on simulating unstable flow and mixing of variable density fluids in seemingly homogeneous porous media are rare. In this study, one dimensional (1-D) model were developed to simulate unstable flow and mixing in a vertical, normally 1-D system. The 1-D numerical model was derived from a theoretical model to simulate the flow and the mixing of fluids with variable density and viscosity at the field scale. To evaluate the models, simulated results were compared with experimental data from displacement experiments in a vertical send column. The results show that the 1-D model provides fairly good prediction of breakthrough curves.

KEYWORDS: Groundwater, Gravitational Instability, Fingering, Variable Density Fluids

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