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Type: Oral Presentation

A detailed pore scale modelling of colloid transport in porous media using lattice Boltzmann method

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Abstract

A fully coupled pore scale model was developed with the aim of exploring the effects of hydrodynamic forces, ionic strength, and zeta potential on colloids transport under both favourable and unfavourable conditions. The Lattice Boltzmann-Smoothed Profile method was used to simulate particle-particle and particle-fluid interactions without a need for assumptions of dilute suspension and clean bed filtration. Simulation using a wide range of parameters have shown creation, and breakup of agglomerates. Results are used to obtain time-averaged behaviour of transport properties, such as pore void fraction, conductivity, and surface coverage. We have found that in comparison with zeta potential, increasing ionic strength had a greater impact on particles behaviour. A raise in ionic strength, and a decrease in flow velocity caused a decrease in pore void fraction and its conductivity and an increase in aggregates connectivity.

Time Block Preference

Time Block A (09:00-12:00 CET)

References

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