



Contribution ID: 158

Type: Oral Presentation

Co-transport of engineered nanoparticles and bacteria in soil

Monday, 13 May 2024 13:25 (15 minutes)

Increasing production and wide application of engineered nanoparticles lead to their ultimate release into the environment, thereby contaminating water, air, and soil. Suspended bacteria are ubiquitous in the subsurface and can affect the transport of nanoparticles. This study investigates the fate and transport of zinc oxide nanoparticles (nZnO) in saturated soil in the presence of suspended *E. coli* through a coupled experimental and modelling approach. *E. coli* was found to enhance the transport of nZnO. However, *E. coli* transport was retarded in the presence of nZnO. The difference in the transport behaviour of nZnO and *E. coli* during the cotransport and individual transport studies is because of the competition between them in finding attachment sites on grain surfaces and also due to the formation of nZnO-*E. coli* heteroaggregates. The experimental results were successfully simulated using a model which accounted for nZnO and *E. coli* retention in soil, heteroaggregation kinetics, and heteroaggregate retention in soil.

Keywords: ZnO nanoparticles, bacteria, cotransport, modeling, soil

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Porous Media & Biology Focused Abstracts

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References

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Conference Proceedings

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Session Classification: MS05

Track Classification: (MS05) Microbial Processes in Porous Media: Risks and Advances