Transport of Reacting Chemicals. (S01-yates111723-Oral)

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Abstract:

A mass transport equation for coupled second-order reaction between two chemical compounds in a soil-water system is described. The solution under consideration is appropriate to describe the fate and transport of pesticides in the presence of nucleophilic materials, such as ammonium thiosulfate. Previous research has shown that several classes of pesticides (for example soil fumigants) react with ammonium thiosulfate following a second-order rate law. Several solutions to the system of non-linear equations have been found and the approach is tested using experimental data obtained in a saturated soil column. The system is simulated using the method-of-characteristics, since an analytical solution that allows dispersion was not found. A comparison is presented between simulated and experiment measurements. The transport of compounds undergoing second-order chemical reaction can express unusual concentration profiles.

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