



Multispecies transport analytical model with different chain decay reaction pathways

Cheng-Hung Chang and Jui-Sheng Chen

National Central University, Graduate Institute of Applied Geology, Taiwan (sosohung20@gmail.com)

Multispecies transport analytical model is a cost-effective tool for better understanding the transport behavior in the subsurface environment. Analytical solutions for coupled multispecies solute transport problems are difficult to derive and relatively few. Although several multispecies transport analytical model have already been reported in the literature, those currently available have the primarily been derived based on advection-dispersion equations with straight chain decay reaction pathways. This study presents some new analytical model for multispecies transport with different chain decay reaction pathways. The closed-form analytical solutions to a set of coupled advection-dispersion equations are obtained by using the Laplace and generalized integral transform. Solutions for different chain decay reaction pathways are generated and are verified against numerical model that solved the same governing equation systems using the Laplace transform finite difference technique.