

998-35-178

M. Carmen Hernandez-Rendon* (carmenhr@tonatiuh.igeofcu.unam.mx), Circuito de la Investigacion S/N, Cd. Universitaria, 04510 Mexico, D.F., Mexico. *An operator splitting algorithm for biodegradable transport in porous media*. Preliminary report.

Biological processes are of great importance in modeling transport of species in aquifers contaminated by organic compounds. When considering these phenomena, a system of coupled partial differential equations is obtained. Besides the numerical difficulties typical of advection-dominated flows, stiffness may be introduced in the system because the range of characteristic reaction time is huge. In this work a second order operator splitting method is applied to simulate transport of species undergoing biodegradation in porous media. The mathematical model takes into account mass balance of chemical species involved in the successive transformations. Nonlinear reactions are included since biological decay is described by Monod type kinetics. In this three step method, the advection-diffusion operator is solved implicitly in the first and third subintervals, while chemical reactions are approximated in the second one. Numerical results for different test cases are presented and discussed. (Received February 24, 2004)