

A fast precipitation and dissolution limit for a reaction-diffusion system arising in porous medium

by

Danielle Hilhorst and Hideki Murakawa

After reviewing the singular limit of solutions of a number of competition-diffusion systems, we will consider a three component reaction-diffusion system which models reactive transport in a cement based material where one mineral and two aqueous species react according to a kinetic law. We will analyse the asymptotics of the reaction-diffusion model as the reaction rate becomes infinite. The singular limit turns out to have the form of a Stefan free boundary problem.