

Convergence to a self-similar solution for a one-phase one dimensional Stefan problem arising in corrosion theory

Danielle Hilhorst (Université Paris-Saclay)

Steel corrosion plays a central role in different technological fields. In this paper, we consider a simple case of a corrosion phenomenon which describes a pure iron dissolution in sodium chloride. This article is devoted to prove rigorously that under rather general hypotheses on the initial data, the solution of this iron dissolution model converges to a self-similar profile as t tends to infinity. We will do so for an equivalent formulation as presented in the book of Avner Friedman about parabolic equations. In order to prove the convergence result, we apply a comparison principle together with suitable upper and lower solutions. This is joint work with Meriem Bouguezzi, Yasuhito Miyamoto and Jean-François Scheid.