

Mathematical modelling and simulation of corrosion in an underground repository

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The modelling and the numerical simulation of corrosion take part in the general description of the nuclear waste repository. After a brief introduction of the context of the study, I will introduce in a first part the Diffusion Poisson Coupled Model (Electrochemical Acta 2010) that describes the transport of charges in an oxide layer. I will review the main results obtained for the DPCM and show some numerical experiments. In a second part, I will explain how some minor corrections lead to a thermodynamically consistent model, so that the new model has a variational structure, and I will present the recent results we were able to prove on this new model.

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