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# Continuous dependence of solutions to the free boundary problem describing adsorption phenomena on boundary data

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## Abstract

Recently, we have proposed a one-dimensional free boundary problem as a mathematical model for adsorption phenomena appearing in porous media. More precisely, the relationship between the relative humidity and the saturation of degree is represented by the relationship between the boundary data and the position of the free boundary. By numerical simulations we can say that our free boundary problem is one of good mathematical description for the adsorption phenomena. On this free boundary problem we already established the existence and the uniqueness of a solution. Also, under some suitable conditions we obtained the large time behavior result of the free boundary. As a next step we consider a concrete carbonation problem in a three-dimensional domain with adsorption phenomena. In order to apply our free boundary problem to the concrete carbonation problem it is necessary to investigate continuous dependence of the solution on boundary data, because the concrete carbonation problem consists of some partial nonlinear differential equations with coefficients given by a gradient of saturation. In this talk we show modeling, mathematical results and graphs from numerical simulations on adsorption phenomena.

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