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MULTICOMPONENT ADSORPTION AND TRANSPORT BEHAVIOR OF ACIDITY AND ANIONS IN A GOETHITE/SILICA SAND SYSTEM. J. Kleikemper*, A.M. Scheidegger, D.L. Sparks, Department of Plant and Soil Sciences, University of Delaware, Newark, Delaware 19717-1303; J.C.L. Meeussen, Macaulay Land Use Research Institute, Craigiebuckler Aberdeen, Scotland

The classical approach to model monocomponent transport behavior of reactive species in columns is to calibrate an empirical sorption model with a sorption isotherm obtained from independent batch experiments. These batch experiments have to be carried out under constant conditions with respect to salt level and pH. However, in natural systems these parameters are seldom constant. To understand the transport behavior of reactive species in such systems, it is necessary to include the pH dependence of the adsorption process and mass transfer of acidity.

In this study, multicomponent transport experiments of anions at variable pH in a goethite/silica sand column will be presented. Furthermore, we will show to what extent an independently calibrated mechanistic adsorption model for anions and proton sorption on variable charged surfaces is able to predict the experimental breakthrough curves.