

Kinetics of Oxyanion Adsorption/Desorption on Goethite: A Pressure-Jump Relaxation Study. P. G. GROSSL*, M.J. EICK, D.L. SPARKS, and C.C.AINSWORTH, *University of Delaware and Battelle Pacific Northwest Laboratories.*

We used pressure-jump relaxation kinetics to explore the adsorption/desorption of the oxyanions, chromate and arsenate, on goethite (α -FeOOH). Experimental conditions included equilibration of a 10 g goethite (surface area 52 m^2) suspension with initial total soluble chromate and arsenate concentrations ranging from 0.5 to 3 **mM** and 0.01 **M** NaNO_3 added as a background electrolyte. Treatment pH values ranged from 4.5 to 8.0 and all experiments were run at 25°C . Samples were subjected to pressure perturbations and the ensuing relaxations were monitored by conductivity detection. We observed double relaxation events for the sorption of both oxyanions on goethite. We attribute the relaxations to the initial formation of an inner-sphere monodentate surface complex followed by a second ligand exchange reaction that resulted in the formation of a bidentate chromate- and arsenate-surface complex. The information acquired from these experiments can help predict the sorption behavior and ultimate fate of oxyanion contaminants in soil environments.