Electron Paramagnetic Resonance (EPR) Spectroscopically Monitored Stopped-Flow Kinetics. S.E. FENDORF* and D.L. SPARKS, *University of Delaware.*

Many reactions at the solid/solution interface are rapid, and thus, have precluded the used of traditional batch and flow techniques for kinetic investigations. In this paper, we describe the novel application of a kinetic technique which is capable of directly monitoring a reaction involving an EPR active species *in situ* on a millisecond time scale, an electron paramagnetic resonance stopped-flow (EPR-SF) kinetic method. The EPR-SF technique has many advantages for investigating reactions involving an EPR active species. In this study, we demonstrate some of these attributes by investigating the rapid sorption/desorption of Mn(II) on δ-MnO_2. Under the conditions of this study, a first-order rate dependence on Mn(II) was observed. The forward rate constant was determined experimentally, while the reverse rate constant was calculated using an integrated first-order rate expression and the measured forward rate constant. In addition to measuring rapid reactions the EPR-SF technique is suitable for monitoring slower reaction. Accordingly, we also provide an analysis of the reductive dissolution rate of Mn-oxides by Cr(III).

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