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# TRACE METAL FATE DURING REACTION OF MANGANESE OXIDE MINERALS WITH SMALL ORGANIC ACIDS UNDER AEROBIC CONDITIONS

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Manganese oxide minerals play an important role in biogeochemical cycles, as they are readily reactive and widespread throughout soils and aqueous environments. These minerals coexist with trace metals, in addition to organic acids produced by plants and microbes, often under aerobic conditions. The adsorption of trace metals to minerals affects their availability and speciation in the surrounding environment; this has significant implications for environmental remediation techniques and our understanding of biogeochemical systems. In this study, we examine the fate of trace metals when they adsorb to these minerals in the presence of organic acids and oxygen.

MnO<sub>2</sub> suspensions were reacted with Zn, oxalate, and citrate under aerobic conditions over a two week period, with samples taken approximately every 48 hours. The fluid chemistry of this system was tracked and the concentrations of Zn and aqueous Mn were recorded.

These experiments were conducted at pH 7 and pH 4, acidities typical of soil and groundwater environments. It was found that the mineral suspension containing citrate yielded the most Mn and Zn in solution, while the suspensions containing oxalate or no acid yielded significantly less reduction. Although this study should be considered a work in progress, the results of our experiment pose several research questions that may be examined to round out an understanding of the complications involved in the reactions between Mn oxides, trace metals, and organic acids.