

pH-induced structural change in biogenic Mn(IV)-oxides

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Mn-oxides play important roles in controlling the behavior of heavy metal(loid)s and organic compounds in the environment. Microbially-mediated Mn oxidation is thought to be one of the major sources of manganese oxides in soils. Studies have shown that the pH at which biological Mn(II) oxidation by *P. putida* strain GB-1 takes place controls the abundance of Mn(III) and the density of vacancy sites in biologically precipitated Mn(IV) oxides (BioMnO_x). In this study we investigate the effect of pH on the structural properties of preformed BioMnO_x, since pH changes are prevalent in the natural environment. XAFS analyses revealed that the structure of BioMnO_x formed at pH 8 in a 16.67mM CaCl₂ solution was not modified by exposure to low pH solutions until the pH decreased to 5. However, the structure of BioMnO_x formed at pH 8 in a 50mM NaCl solution was altered even by a pH 7 solution. These data indicate that the geochemistry of biogenic manganese oxides can be affected by environmental changes such as pH.

[General Papers](#)

6:00 PM-8:00 PM, Wednesday, August 20, 2008 Pennsylvania Convention Center -- Hall C, Poster

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