

Does biogenic iron oxide organic matter affect anion contaminant behaviour?

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Biogenic iron oxides (BIOS) form wherever anoxic waters rich in iron encounter oxygen. They are (mostly) amorphous iron oxides that contain large amounts of organic matter, rich in polysaccharides which act as important sorbents for cationic metal ions due to their net negative charge and high surface area. Numerous reports suggest they may also be good sorbents for anionic contaminants such as phosphate and arsenic. A laboratory model of co-precipitated polysaccharides and iron was made with varying organic carbon contents in order to investigate phosphate and arsenic (As(III) and As(V)) sorption behaviour at circumneutral pH. Dialysis experiments investigate the direct interaction of arsenic and phosphate with freshwater bacterial exopolysaccharides. Field collected samples generally had lower sorption capacities for contaminants, presumably due to the non-homogeneity of the samples. Laboratory experiments are compared with a wide range of field data. This talk will discuss how the presence of bacteria and their exopolysaccharides in iron rich environments affects the speciation and mobility of arsenic and phosphate.