

The Department of Civil and Environmental Engineering at the University of Houston presents...

The CIVE 6111 Graduate Seminar Series

Opening the Black Box: What Happens During Surface-Mediated Reduction Reactions

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2:45PM-3:45PM

Classroom Business Building (CBB) Room 106

Abstract

Iron oxides are important mineral phases in soils, surface waters, and aquifers. Numerous studies have demonstrated that iron oxide nanoparticles play important roles in oxidation/reduction processes and in the degradation of organic pollutants in aquatic systems. Thus, the presence of iron oxides is thought to be critical for the biological and abiotic attenuation of oxidized groundwater contaminants, including chlorinated solvents, pesticides, and munitions. Much of the laboratory work used to understand contaminant and iron oxide reactivity, however, is conducted under highly idealized conditions. Additionally, most often, the focus is solely on the removal of the pollutant and not changes in the surface and how this could affect reactivity over time. There is still much to be understood, however, about the reactivity of iron oxide nanoparticles in actual groundwater systems, where mineralogy and solution conditions are complex and variable over time. This talk will explore how solution conditions and the presence of other, non-reactive minerals, affect the dynamics of reactions at iron oxide mineral surfaces. The use of compound specific isotope analysis to evaluate the reactions that nitroaromatic pollutants undergo in groundwater systems will also be presented.

Bio

William Arnold is a Distinguished McKnight University Professor and the Joseph T. and Rose S. Ling Professor and Associate Head of the Department of Civil, Environmental, and Geo- Engineering at the University of Minnesota. His research focuses on the fate of organic chemicals in natural and engineered aquatic systems. He received his S.B. in Chemical Engineering from MIT (1994), M.S. in Chemical Engineering from Yale (1995), and Ph.D. in Environmental Engineering from the Johns Hopkins University (1999). He then joined the U of MN faculty.