2015 Fall Environmental Engineering Seminar Series

Title: Aqueous catalytic technologies for water purification and biorenewable chemical production

Timothy J. Strathmann
Professor of Civil and Environmental Engineering
Colorado School of Mines

Date: Friday, September 18th, 2015
Time: 12:00 PM – 1:00 PM
Place: ECCR 150

Abstract

Population and global development trends are spurring demands for new sources of safe drinking water and low-cost supplies of energy and chemical feedstocks while simultaneously producing a growing quantity of wastes. Sustainably meeting these needs is a grand challenge that will require transformative technologies. Recent advances in materials science and nanotechnology are inspiring new technologies that have significant potential to revolutionize water and wastewater treatment practices, including enabling resource-positive waste treatment and widespread potable reuse of wastewater. This seminar will describe my group’s research on the development of innovative catalytic technologies for two applications: (1) treatment of recalcitrant aquatic contaminants of emerging concern (e.g., oxyanions, nitrosamines), and (2) valorization of wastewater and biomass through hydrothermal conversion to fuels and other valuable chemicals. After providing an overview of our work, I will focus on recent projects targeting the development of new metal catalysts for treatment of oxyanion pollutants (e.g., perchlorate), and the development of hydrothermal catalytic processes for conversion of fatty acids/esters to liquid hydrocarbon fuels. I will conclude with a discussion of challenges to the adoption of catalytic technologies in the water and waste treatment sectors that guide my future research directions.

Timothy Strathmann is currently a Professor in the Department Civil and Environmental Engineering at the Colorado School of Mines, and holds a collaborative research appointment at the National Renewable Energy Laboratory. From 2003 to 2014 he was on the faculty at the University of Illinois at Urbana-Champaign. His research focuses on the development sustainable catalytic technologies for water treatment and waste valorization, and the study of redox transformation mechanisms for contaminants of emerging concern (CEC). Dr. Strathmann is the recipient of a National Science Foundation CAREER Award, and his research has been sponsored by NSF, USEPA, USDA, DOD, DOE, and the Water Research Foundation. Dr. Strathmann’s formal training includes a PhD in environmental engineering from Johns Hopkins, BS and MS degrees from Purdue, and postdoctoral training at Princeton.