

Characterizing Complex Mixtures For Improved Chemical Processes

Presented by

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Abstract

Characterization of complex mixtures is challenging due to the magnitude of potential interactions between mixture components. We seek to understand the thermodynamics and transport phenomena of small molecules in complex mixtures with a focus on material synthesis and processing for catalysis and nuclear fuel reprocessing. These applications are extremely important to modern society as catalytic processes account for 80% of industrial chemical processes and nuclear fuel waste is persistent and extremely hazardous. Small molecules, including surfactants, chelating agents, and solvent modifiers interact and assemble at the molecular level. In this seminar, the use of and characterization of complex mixtures will be explored when applied to (1) nanoparticle-based catalyst synthesis using switchable surfactants and chelating agents capable of self-assembly and (2) the purification of spent nuclear fuel using chelating agents and solvent modifiers.

Biography

Steven R. Saunders received his B.S. in Chemical and Petroleum Engineering from the University of Pittsburgh in 2006. His Ph.D. was earned at Auburn University in 2011 investigating the thermodynamics of nanoparticle dispersion in tunable solvents for the size-selective fractionation of nanoparticles. After lecturing at Auburn University, Dr. Saunders then joined Georgia Institute of Technology as a post-doctoral fellow in 2011 investigating model mixtures of polymers to determine fundamental degradation pathways. Dr. Saunders then joined the Voiland School of Chemical Engineering and Bioengineering in 2013. The Saunders Lab at WSU is focused on understanding the thermodynamics and transport phenomena of small molecules in complex mixtures with a focus on material synthesis and processing for catalysis, nuclear fuel reprocessing, and food science. Dr. Saunders is an NSF CAREER awardee and has been funded by the USDA-NIDA and Terrapower. Dr. Saunders was given the 2017 Reid Miller Excellence in Teaching Award in the Voiland College of Engineering and Architecture.

Thursday August 22nd, 2019

11:00am to Noon

ETRL room 101

Meet the speaker before the seminar in ETRL room 119, 10:30am to 10:50am. Light refreshments will be served.

