Chemical and Petroleum Engineering

Levi Thompson

Richard E. Balzhiser Professor of Chemical Engineering
Professor of Mechanical Engineering
Director, Hydrogen Energy Technology Laboratory
Principal Investigator, Michigan Louis Stokes Alliance for Minority Participation
The University of Michigan

Professor Thompson earned his B.ChE. from the University of Delaware, and M.S.E. degrees in Chemical Engineering and Nuclear Engineering, and a Ph.D. in Chemical Engineering from the University of Michigan. He served as Associate Dean for Undergraduate Education in the College of Engineering from 2001 to 2005, and is currently Director of the Hydrogen Energy Technology Laboratory and Director of the Michigan-Louis Stokes Alliance for Minority Participation. He has published nearly 150 journal articles and several book chapters describing his groups research in the area of nanostructured materials, is co-inventor on more than 10 patents, and has given more than 150 invited presentations. Professor Thompson is recipient of awards including a 2006 Michiganian of the Year Award for his research, entrepreneurship, and teaching, National Science Foundation Presidential Young Investigator Award, McBride Distinguished Lectureship, Union Carbide Innovation Recognition Award, Dow Chemical Good Teaching Award and Engineering Society of Detroit Gold Award. He is also co-founder and founding CEO of T/J Technologies, a developer of nanomaterials for advanced batteries; the company was acquired by A123 Systems in 2006. He recently co-founded Inmatech to commercialize low cost, high energy density supercapacitors for automotive and military applications. Professor Thompson was Consulting Editor for the AIChE Journal and served on the National Academy's Chemical Sciences Roundtable and American Institute of Chemical Engineers (AIChE) Board of Directors. He presently serves on the Department of Energy Hydrogen Technology Advisory Committee, University of Delaware College of Engineering Advisory Council and City College of New York Department of Chemical Engineering Advisory Board. He is also active in the community, serving on the Board of Trustees for the Ann Arbor Area Community Foundation and the African American Endowment Fund.

"Turning Base Metals into Precious Metals: Nanostructured Early Transition Metal Carbides and Nitrides"

Abstract

The addition of carbon and nitrogen to early transition metals like molybdenum and vanadium can result in materials with properties that are similar to those of platinum group metals (PGMs). In the mid-1970s, for example, it was discovered that tungsten carbides can catalyze hydrogenation reactions that previously were only known for PGMs, and more recently we observed that molybdenum nitrides are capable of bulk hydrogen storage like Pd. Since then, early transition metal carbides and nitrides have been investigated for a variety of reactions. This paper will describe our work to design and synthesize nanostructured early transition metal carbides and nitrides for selective hydrogenations. Our research has focused on understanding the genesis of the materials, unraveling the reaction mechanisms and determining structure-function relationships that will enable the rational design of these materials. Of particular interest are CO_2 hydrogenation and ammonia synthesis, reactions for which new catalysts are needed to reduce energy consumption.

Tuesday, February 27th, 2018 | 10:00 – 10:50AM

2 Eaton Hall (Spahr Auditorium)