



SCHOOL OF
CHEMICAL ENGINEERING
College of Engineering, Architecture and Technology

CHE SEMINAR SERIES

Fundamental catalysis research with industrial applications in fuel production

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Production of clean transportation fuels has made hydro processing catalysis a ubiquitous step in modern-day refineries. Removing sulfur, nitrogen, and aromatics from petroleum fuels enables cleaner burning gasoline and diesel. Converting biomass feedstocks into gasoline, jet, and diesel also requires hydro processing to remove oxygen, modify the boiling point, and meet cold flow properties. Meeting the challenge of efficiently producing clean transportation fuels via hydro processing obliges us to develop a molecular understanding of the necessary catalytic reactions. In this presentation, we will discuss examples of how fundamental research is connected to issues of practical importance in an industrial setting. Specifically, we will share how insights into the role of hydrogenation of polynuclear aromatics and the inhibition effect of nitrogen species can explain phenomena in a realistic setting. We will also provide an outlook on new challenges of hydro processing with the increase in renewable feedstock processing.

107 ENGINEERING NORTH

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Clark Miller is a Principal Engineer with the Catalyst Optimization team in Phillips 66. He received a Ph.D. in Chemical Engineering from the University of Wisconsin-Madison and a B.S. in Chemical Engineering from Brigham Young University. He joined Phillips 66 in 2008 and has worked for more than 15 years in hydro processing catalysis of petroleum and renewable feeds. He also has experience in naphtha reforming and advanced process development. Clark has authored 7 peer reviewed publications, 4 patents, and 86 internal company research reports. He is currently Industry Liaison and Secretary of the Great Plains Catalysis Society.

