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Wednesday, September 12th, 2018
Clarion Hotel, 60 Cottontail Ln, Somerset, NJ 08873

Professor Paul J. Dauenhauer



Department of Chemical Engineering and Materials Science
University of Minnesota

**Assessing and Predicting Hydrocarbon
Accessibility and Motion in Confined Spaces**

Zeolites, metal organic frameworks, and nanotubes exhibit pockets, cavities and pores with spatial dimension comparable to the size of commodity chemicals and fuels (i.e., angstroms). At the molecular scale, subtle variation in micropore size and shape dramatically alters the ability of molecules to access catalytic active sites; similarly, the size, shape and flexibility of hydrocarbons determine their ability to squeeze, rotate, and translate in confined spaces. In this work, we present the technique of “reactive gas chromatography” to quantitatively assess the accessibility of hydrocarbons to active sites within microporous materials. A broad range of hydrocarbon sizes and shapes are evaluated within MFI framework, and the ability of molecules to access active sites is compared with methods for predicting the size of molecules and pores. The ability to predict the behavior of molecules within engineered porous environments advances the potential for size selective and sterically-controlled catalytic conversion of hydrocarbons.

Speaker Bio:

Paul J. Dauenhauer is Associate Professor of Chemical Engineering and Materials Science at the University of Minnesota. He serves as Co-Director of the Catalysis Center for Energy Innovation. He received his B.S. in Chemical Engineering and Chemistry from the University of Wisconsin Madison and Ph.D. in Chemical Engineering from the University of Minnesota. He worked for the Dow Chemical Company as a Senior Research Engineer in Midland, MI, and Freeport, TX. His work on catalysis and reaction engineering of renewable feedstocks has been highlighted by numerous awards including the DOE Early Career, NSF CAREER, the Rutherford Aris Excellence in Reaction Engineering Award, the AIChE CRE Young Investigator Award, and the Camille Dreyfus Teacher-Scholar Award. He is the co-founder of Sironix Renewables and inventor of the flagship technology for Activated Research Company.

Dinner is a buffet, and includes <u>a choice of beef, chicken or fish</u>		Members	\$40
		Non-members	\$50
Social Hour (Cash Bar)	6:00 PM	Students	\$25 (<i>Student Members = \$10</i>)
Dinner	7:00 PM	Retired/Post-Doc/Unemp.	\$40 (<i>Members = \$30</i>)
Presentation	7:45 PM	Annual Membership Dues	\$35 (<i>Students = \$15</i>)

Deadline for dinner reservations is 4:00 p.m. Friday, September 7th, 2018

To make your reservation, fill out the [online form](#). With the exception of extreme circumstances, anyone not canceling reservations by the above deadline will be billed for dinner regardless of attendance.

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