School of Chemical, Biological and Materials Engineering

Phillips 66
Seminar Series
2019-2020

Tuesday, September 24, 2019
3:00 p.m. - 4:00 p.m.
Sarkeys Energy Center A-235

Dr. William F. Schneider
H. Clifford and Evelyn A. Brosey Professor of Engineering
Department of Chemical and Biomolecular Engineering
University of Notre Dame

"The Catalytic Science of Making Up and Breaking Up Dinitrogen"

The chemistry of nitrogen is inextricably linked with humanity's use of energy. Industrial nitrogen fixation (N_2 ---->NH_3) revolutionized the production of fertilizer and enabled the population explosion of the 20th century, consuming several percent of the world's energy annually in the process. NO_x reduction (NO_x---->N_2) is integral to reducing the terrible adverse impacts of automobile use on urban air quality and health. These and other successful technologies all depend at their heart on heterogeneous catalysis. In this presentation I will discuss the insights we have gained by applying molecular-level models and concepts to nitrogen catalytic chemistry. Examples will be drawn from our work on the selective catalytic reduction of NO_x, a problem that has led us to rethink the factors that govern reactivity in zeolites, from NO and NH_3 oxidation, problems that have caused us to revisit how we model reactions at metal surfaces, and from N_2 reduction, where we are exploring the potential to bypass the constraints imposed by mother nature on the performance of conventional catalysts.

****Required Graduate Student Seminar for ChE 5971****

Refreshments served before Seminar

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