

CHEMICAL ENGINEERING

SEMINAR SERIES



LARS GRABOW

10/17/16

Assistant Professor of Chemical and Biomolecular Engineering, Assistant Professor of Chemistry
University of Houston

Using Water as a Co-catalyst in Heterogeneous Catalysis to Improve Activity and Selectivity

ABSTRACT: “What happens when you add water?” is possibly the most frequently asked question after presentations in heterogeneous catalysis. In this talk, I will demonstrate that this question is indeed paramount and that the presence of even minute amounts of water can drastically change reaction rates and product selectivities. Examples include water-mediated proton hopping across a metal-oxide surface, oxidation of carbon monoxide at the gold/titania interface, and hydrodeoxygenation of phenolic compounds over titania supported ruthenium catalysts. Together, these examples demonstrate that water can act as co-catalyst in a variety of catalytic reactions and by varying the amount of water it may be possible to tune reaction rates and product selectivity.

BIOGRAPHY: Dr. Lars Grabow joined the Department of Chemical and Biomolecular Engineering at the University of Houston as tenure-track Assistant Professor in Fall 2011 and accepted a joint appointment with the Department of Chemistry in February 2014. He received his PhD in Chemical Engineering under the guidance of Manos Mavrikakis from the University of Wisconsin in 2008 and continued his research between 2008 and 2011 in the group of Jens Nørskov at the Technical University of Denmark and Stanford University. His expertise is the application of electronic structure calculations (Density Functional Theory) and kinetic modeling to problems in heterogeneous catalysis and surface science.

Dr. Grabow won the prestigious U.S. Department of Energy (DOE) Career Award (2014) and the NSF CAREER Award (2015), the Teaching Excellence Award of the Cullen College of Engineering at the University of Houston (2014). He currently serves as 2nd Vice Chair on the leadership board of the AIChE Catalysis and Reaction Engineering division.

RECEPTION 3:30 • LECTURE 4:00 – 5:00
PHYSICS ASTRONOMY BLDG. (PAA) A110

W **CHEMICAL ENGINEERING**
UNIVERSITY of WASHINGTON
Knowledge and solutions for a changing world