"Learning to Use Molecular Oxygen as a Reagent in Homogeneous Catalysis"

Wednesday
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3:00 pm
Wu and Chen Auditorium
Levine Hall

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Abstract

From environmental and economic standpoints, molecular oxygen represents the ideal oxidant for chemical transformations. It is readily available, inexpensive (particularly if used without separation from air) and environmentally benign. However, more expensive and/or hazardous oxidants are often employed in homogeneous metal-catalyzed oxidation reactions. An insufficient knowledge of how transition metal complexes react with molecular oxygen has inhibited catalyst design of effective aerobic systems. Kinetic and mechanistic studies of the reactions of oxygen with various late metal complexes, including metal alkyls and hydrides, will be presented along with our nascent mechanistic understanding of these reactions. The generality of these aerobic oxidations and the potential for incorporation into alkane functionalization strategies will be discussed.

Bio

Karen Goldberg is currently a Vagelos Professor of Energy Research at the University of Pennsylvania and the inaugural Director of the Vagelos Institute for Energy Science and Technology. She received her A.B. degree from Barnard College of Columbia University and her Ph.D. in Chemistry from the University of California at Berkeley. Following a postdoctoral year at The Ohio State University, she joined the faculty at Illinois State University, a primarily undergraduate institution. In 1995, she moved to the University of Washington (UW) as an Assistant Professor of Chemistry. After rising through the ranks at UW, she became the first Nicole A. Boand Endowed Professor of Chemistry, and also served as Director of the first National Science Foundation Phase II Center for Chemical Innovation (CCI), the Center for Enabling New Technologies through Catalysis (CENTC) from 2007-18. Her research is focused on the development of new catalytic systems to efficiently produce chemicals and fuels from a range of available feedstocks. She serves on the advisory boards of various research centers, institutes and journals. Goldberg was elected a Fellow of the American Association for the Advancement of Science in 2012, to the American Academy of Arts and Sciences in 2017 and to the National Academy of Sciences in 2018.

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