SPRING 2022 CHEMISTRY SEMINAR SERIES

DR. ANTHONY CHIANESE

Department of Chemistry
Colgate University
Hamilton, NY

HOST:
DR. PROKOPCHUK

ALL THOSE INTERESTED ARE WELCOME TO ATTEND

"How does Milstein's Catalyst Really Work? Identifying the Active Species in Ruthenium-Pincer-Catalyzed Hydrogenations"

Friday, February 25, 2022, 11:30 AM
Life Science Center II, Room 130

Abstract: The development of bifunctional catalysis, where a transition-metal ion cooperates with a functional group on the supporting ligand, has enabled the efficient hydrogenation of a wide range of polar substrates including esters, amides, and carbon dioxide. The most efficient catalysts often feature the key involvement of an N-H group on the ligand, but in 2005 Milstein and coworkers reported a ruthenium-PNN-pincer catalyst lacking such a group. This seminar we describe the Chianese group's efforts to elucidate the mechanism for ester hydrogenation catalyzed by this ruthenium complex. We have demonstrated that the complex is activated by initial loss of ethane, followed by reaction with hydrogen to give an active species with an N-H group. Through a combined experimental and computational study, we have shown that the nascent N-H group is intimately involved in the catalytic mechanism.

Biographical sketch: Dr. Anthony Chianese obtained his BA in 2001 from Drew University, conducting research with Barbara Petrack. After his graduate studies at Yale University under the direction of Robert Crabtree, he earned his PhD in chemistry in 2005. After one year as an NRC postdoctoral research associate with Mike Gagné at UNC-Chapel Hill, he accepted a position at Colgate in 2006, where he has worked since then.

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