UCMERCED | CHEMISTRY & BIOCHEMISTRY

DATE 05/03/2024 | TIME 10:30am | LOCATION COB1 110

CHEMISTRY & BIOCHEMISTRY SEMINAR SERIES:

A boron love story: method design and mechanistic investigations guide our future

Abstract:

Boron-containing molecules are privileged motifs in synthetic organic chemistry, serving as functional group surrogates in bond-forming reactions. As such, the invention of new methods to install these groups onto organic molecules, or deploy compounds containing these linkages, are welcomed. As such, our group's fascination with the broad reactivity profile of boranes underpins our work in this field. This talk will discuss the chemistry of three different classes of boron compounds: diboron molecules, boronic acids, and aminoboranes in the context of understanding/creating ground- and excited state systems. More specifically, we use diboron reagents as tools to quantify the degree of aryl radical generation under photochemical conditions and to facilitate the extraction of mechanistic clues. In contrast, we investigate boronic acids and aminoboranes as reagents enabling the invention of new synthetic strategies to diversify organic molecules. Taken together, the results presented in this talk serve as the foundation upon which our future endeavors will advance our goal to create sustainable catalytic methodologies.

Erik A. Romero

Assistant Professor of Chemistry

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About the Speaker:

Erik attended UC Riverside for his undergraduate education. During his time there, he worked in the group of Prof. Thomas Morton on the design of chemical hydrogen storage materials for light-duty automobiles. After his 3rd year, Erik had the opportunity to travel to Los Alamos National Lab to conduct neutron scattering studies on new solid-state electrolyte materials. Following graduation in 2014, Erik moved to Prof. Guy Bertrand's lab at UC San Diego to work with stable carbenes and leverage them as ligands in transition-metal-catalyzed reactions. As part of this research, Erik traveled to Grenoble, France to apply electrochemical techniques to the preparation of organic radical species and to elucidate the mechanisms of radical reactions. For postdoc, Erik moved to Prof. John Hartwig's lab at UC Berkeley to identify conditions enabling silylation and borylation methods of alkyl C-H bonds and to learn the nuances of mechanistic investigations by physical-organic strategies. Upon his move back to UCSD to open his own lab, Erik sought to build his research program around his interests in reaction design, organometallic catalysis, mechanism investigation, and photochemistry all the while keeping a keen eye on process sustainability.

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