

INORGANIC CHEMISTRY SEMINAR



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“Hydrocarbon Upgrading with Boron and Earth-Abundant Metals”

Abstract: The products of fossil fuels, specifically hydrocarbons, are ubiquitous in our daily lives, making up everyday objects from the plastic container that holds your lunch to the fuel that enables us to interconnect the globe. These products are at the core of our modern society, however the development of new boron-carbon and carbon-carbon bonds in these motifs is fundamentally challenging. The first part of my presentation will explore methodology for generating boron-containing aromatics. With both limited routes and the restricted amount of commercially available reagents, significant progress is necessary to expand the library of known boracycles. Boroles, highly reactive four π -electron heterocycles, are a family of compounds with the potential to serve as effective reagents to produce unique boracyclic architectures with extended conjugation. The second part of my presentation will focus on upgrading di- and tri-substituted olefins into higher molecular weight products for lubricant production. We found that nickel catalysts with electron-deficient ligands result in a highly electrophilic nickel center that enables efficient olefin dimerization. In the same area, efforts towards sustainable catalysts for the dimerization of commodity dienes to higher value products using surface organometallic chemistry will be described. We have developed a series of silica-supported α -diiimine and pyridine(imine) iron precatalysts that maintain the activity and selectivity of their molecular analogues and can be recycled over multiple uses with minimal erosion in performance.

Wednesday, October 20th 2021

UCLA College | Physical Sciences
Chemistry & Biochemistry

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4:00 p.m. | Via Zoom