Metal-Metal Interactions, Bridging Arene Ligands, and Their Importance in Cooperative Catalysis

Seminar

Monday
Sept. 29, 2025

3:00 – 4:00 p.m.

Beaupre Center, Room 105

The Cueny group is interested in metallophilic interactions, a type of metal-metal bonding between two formally closed-shell metal species. These weak metallophilic interactions contrast those of more traditional open-shell metal species that form covalent metal-metal bonds. In particular, we are interested in the stability of dinuclear complexes bearing bridging hydrocarbyl ligands between the two metal centers in addition to metallophilic interactions. These types of dinuclear structures are intermediates in the transmetallation process, e.g. Cu/Pd species in the Sonogashira coupling reaction. Here, we examine dinuclear complexes bearing bridging arene ligands with electron donating or withdrawing groups. The relative stabilities of these complexes are critical to the development of cooperative catalytic reactions where transmetallation serves as the key step. For successful cooperative catalysis, the dinuclear intermediate in transmetallation must be kinetically accessible without a high degree of thermodynamic stability, which would inhibit the overall catalytic reaction. Thus, these studies provide a deeper understanding of transmetallation and help us move towards development of cooperative catalysis involving transmetallation between two transition metal complexes.

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Fall 2025 Seminar Series

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