

Synthesis and Catalytic Applications of Earth-Abundant Transition Metal Complexes Containing Pyrrole-Based Pincer Ligands

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The field of organometallic chemistry is traditionally associated with a high degree of metal-ligand covalency. Such a view allows the reactivity and stability of organotransition metal compounds to be conveniently described within the paradigm of the effective atomic number rule (18-electron rule). Our laboratory is interested in exploring the chemistry of molecules containing metal-carbon bonds that do not fit within this classical mold. We term such compounds “non-traditional organometallics” due to their propensity to behave in many instances more like classical coordination complexes with respect to rates of ligand exchange, redox processes, and spin-states. Such compounds are of particular relevance to modern strategies in homogeneous catalysis, which increasingly utilize complexes of earth-abundant transition metals such as Mn, Fe, and Co. In this lecture, the organometallic chemistry of these elements with a class of anionic pincer ligands featuring a central pyrrolide donor (RPNP) will be presented and discussed in the context of mechanistic studies of catalytic reductive functionalization reactions. The stability of the RPNP ligand framework permits detailed study of stoichiometric reactions and the isolation of reactive species that resemble intermediates relevant to catalytic cycles employing earth-abundant metals.

Date: Wed, Sept. 26, 2018

Time: 4:30-5:30 pm

Location: 208 Clark Hall

Students, meet the speaker over coffee and cookies in the Bennett Conference room at 3:30 pm