A3-10 Leveraging Ligand Fluxionality in Organonickel Catalysis

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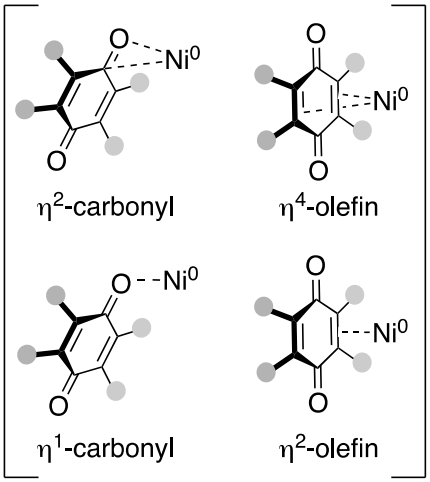
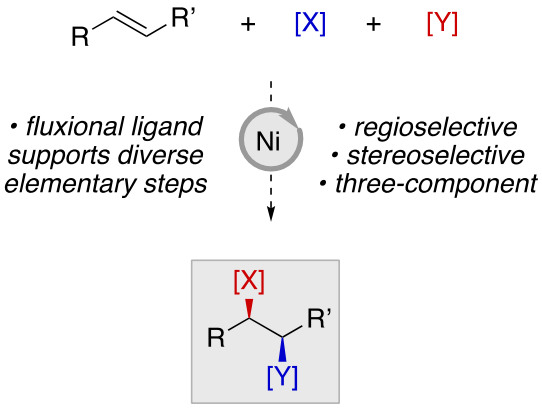
Organonickel catalysis has witnessed a Renaissance during the past decade owing to nickel's ability to maneuver through oxidation states by one- and two-electron redox processes to bring about challenging sp^3-rich fragment couplings. Nickel(0) complexes bearing quinones and related ligands are bench-stable, isostructural analogs of the canonical nickel(0) precatalyst, $Ni(COD)_2$ (COD = 1,5-cyclooctadiene).[1–4] In many contexts, such as in cross-coupling reactions, these Ni(0)–quinone complexes are able to perform equivalently to $Ni(COD)_2$, with their enhanced stability allowing reactions to be conveniently set up without an inert-atmosphere glovebox. Beyond their operational convenience, Ni(0)–quinone complexes have recently attracted attention for their unique reactivity profiles in catalysis, which stems from the ability of the quinone ligand to adopt multiple coordination modes, each with a distinct steric and electronic profile (Figure 1).[5] This seminar will discuss the genesis of this family of pre-catalysts, the current understanding of their mechanisms of action, and applications in enabling otherwise challenging alkene functionalization reactions.





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PROFILE

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