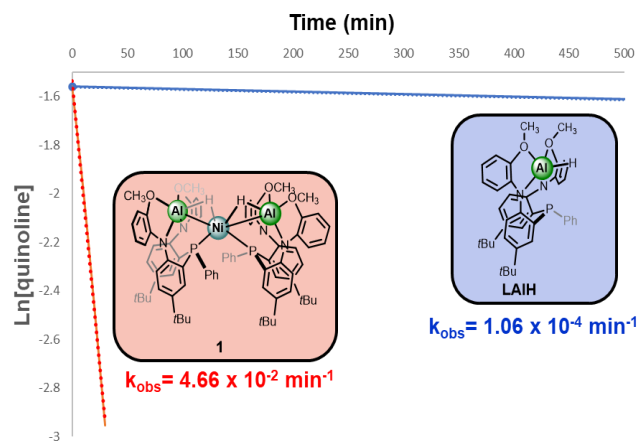
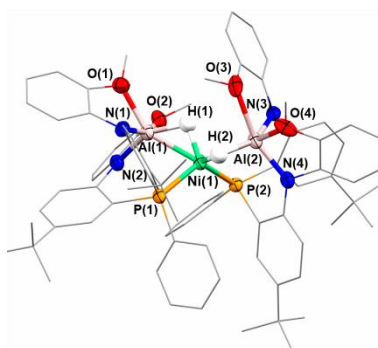
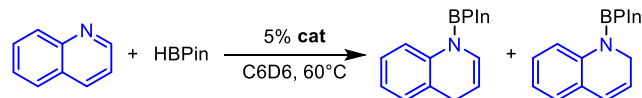
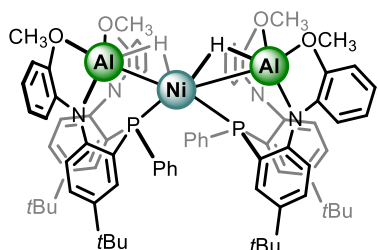


Unleashing The Reactivity of Heterometallic Hydrides in Insertion-Based Molecular Transformations

Prof. Manar M. Shoshani

Well-defined multimetallic complexes are sought-after architectures for small molecule activation due to their potential use as structural analogues in heterogeneous catalytic beds and as active sites in enzymes that facilitate challenging molecular transformations, including insertion-based reactivity and multielectron reduction of small molecules like N_2 , O_2 , and CO_2 . Despite progress in these areas, identifying complexes that can provide high control over activity and selectivity in multielectron reduction products remains a long-standing challenge.

Our lab has developed novel molecular multimetallic architectures composed of redox-active Ni and Lewis-acidic Al, bridged by an activated hydride ligand. We have previously demonstrated that these complexes exhibit hydride moieties that are significantly more reactive in insertion-based studies, particularly in the facile catalytic dearomatization of *N*-heterocycles. One project in the Shoshani lab is dedicated to exploring the scope and mechanism of reactivity stemming from these highly reactive multimetallic hydride moieties.



Heterotrimetallic $NiAl_2H_2$ Architecture and Evidence of Amplified Insertion-Based Reactivity

REU students who work in the Shoshani lab develop expertise in synthetic inorganic and organic chemistry and air-sensitive synthesis. Students will be trained in Schlenk line and glovebox operation as well as usage of high-pressure reactors. Advanced characterization techniques such as X-ray crystallography, NMR and EPR spectroscopy, UV-Vis and IR spectroscopy will also be employed by REU students in the Shoshani lab.