



INORGANIC SEMINAR – 4:00 P.M.
TUESDAY, OCTOBER 27TH, 2015
HUTCHISON HALL 473
DEPARTMENT OF CHEMISTRY
UNIVERSITY OF ROCHESTER



Guest Speaker:
Professor David Vico
Lehigh University
Department of Chemistry

Organometallic Aspects of Alkyl and Fluoroalkyl Cross-Coupling Reactions

Abstract: In the past ten years, first-row metals have been very successful in mediating the cross-coupling of alkyl electrophiles and alkyl nucleophiles. One of the more successful catalysts for alkyl-alkyl cross-coupling reactions is that based on the nickel/terpyridine system. Here, we present our efforts to understand if such a catalyst system enables the much sought-after perfluoroalkyl cross-coupling reactions. The difficult step in metal-mediated perfluoroalkylations is the reductive elimination of R-R_f . It has already been demonstrated by our group and others that [(bisphosphine)Ni(II)] complexes are inert towards this step. However, it has recently been shown that (diimine)nickel complexes can catalyze the coupling of $\text{BrCF}_2\text{CO}_2\text{Et}$ with boronic acids. The authors suggest in this report that the reaction proceeds through a transiently generated Ni(III) fluoroalkyl species. If such a species could be prepared, structure/reactivity parameters could be obtained to help facilitate reductive eliminations at nickel in other systems. Here we present our efforts to prepare Ni(III) perfluoroalkyl complexes and study their reaction chemistry. To enable such studies, new types of perfluoroalkyl dizinc reagents have been developed. The dizinc reagents were found to have interesting properties in their own rights, and could be used to prepare novel organics bearing fluoroalkyl-containing ring systems and perfluoroalkyl tethers.

Host: Professor William Jones, email: jones@chem.rochester.edu