

# INORGANIC CHEMISTRY SEMINAR



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## Base Metal Catalysis Approaches to Greener Hydrofluorocarbon Synthesis

**Abstract:** Unsaturated hydrofluorocarbons possess attractive properties for use as refrigerants, blowing agents, solvents, anesthetics, etc. and some examples have greatly reduced global warming potential relative to their saturated counterparts. To develop chlorocarbon-free synthetic routes we are investigating molecular and heterogeneous base metal catalysts for both the preparation (from waste PTFE) and further elaboration of hydrofluoroalkenes. In this presentation the chemistry of first row metal polyfluorometallacycles will be described with a view to expanding on the nickel phosphite complex-catalyzed hydrodimerization of polyfluoroalkenes. The influence of metal oxidation state, coordination number, and appended Lewis bases in the metal coordination sphere will also be discussed. In another application we seek to use a modified 'Fluoro-Rooney-Green' mechanism for the metal-catalyzed oligomerization of fluoroalkenes. Novel nucleophilic cobalt and nickel fluorocarbene complexes have been prepared and shown to react with tetrafluoroethylene to afford structurally characterized metallacyclobutanes, the first step towards metal-catalyzed fluoroalkene metathesis and, potentially, oligomerization. Finally, reactions of fluoroalkenes with N-heterocyclic carbenes afford new 'push-pull' alkenes that are easily converted to novel polyfluorovinylimidazolium salts.

**Wednesday, March 2, 2016**  
**Cram Conference Room, 3440 Mol Sci**  
**4:30 pm**