

DAKOTA BURDETTE#, and JOANNA WEBB, Department of Chemistry, West Virginia Wesleyan College, Buckhannon, WV, 26201. **Synthesis of rhodium(III) complexes for reductive functionalization studies.**

The partial oxidation of hydrocarbons into alcohols is an economically attractive reaction for the production of commercial chemicals and fuels. This reaction is particularly intriguing in an area like West Virginia where more efficient use of natural gas would be desirable. However, developing a catalytic system capable of inserting an oxygen-atom into a C–H bond without over-oxidation is a substantial challenge. Most catalytic systems that have been reported to mediate hydrocarbon oxy-functionalization are based on platinum. These systems proceed by an initial C–H activation step followed by a reductive functionalization to yield the partially oxidized product. One possible approach to improve catalytic reactivity is to investigate transition metals that are less electrophilic than platinum, such as rhodium. While many rhodium systems have been reported to facilitate C–H activation, there is a relative dearth of complexes capable of reductive functionalization without the use of strong nucleophiles. To this end, synthesis of a series of Rh(III) complexes bearing a nitrogen-based ligand, pip2NNN [pip2NNN = 2,6-bis(piperidylmethyl)pyridine], that should not be susceptible to oxidation is currently underway. The previously reported pip2NNN ligand has been synthesized and reacted with a rhodium starting material to produce the new (pip2NNN)Rh(Cl) complex. Oxidation of this Rh(I) complex to Rh(III) using CH₃X [X = Cl, I, trifluoroacetate (TFA)] is ongoing in order to probe reductive functionalization reactivity.