

MADISON MESSINGER, and JOANNA WEBB. Department of Chemistry, West Virginia Wesleyan College, Buckhannon, WV, 26201. Synthesis of Rh(III) complexes for the study of C–O bond forming reactions: a key step for the conversion of hydrocarbons to alcohols.

The partial oxidation of hydrocarbons into alcohols is an economically attractive reaction for the production of commercial chemicals and fuels, particularly intriguing in an area like West Virginia where more efficient use of natural gas would be desirable. For a catalytic system to facilitate this reaction, a transition metal must be able to break a C–H bond of an alkane and form a new C–O bond to yield the alcohol product. Most catalytic systems that have been reported to mediate the partial oxidation of hydrocarbons are based on platinum. 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 bond-breaking, there is a relative dearth of complexes capable of C–O bond formation. The current work is an ongoing project that focuses on the synthesis of novel rhodium complexes. The complex (pip<sub>2</sub>NNN)RhCl [pip<sub>2</sub>NNN = 2,6-bis(piperidylmethyl)pyridine] has been synthesized and characterized by NMR spectroscopy. Oxidation from this Rh(I) complex to Rh(III) using CH<sub>3</sub>X [X = halide] is currently underway in order to study C–O bond formation reactivity.