DARREN QUEEN, and JOANNA WEBB, Dept of Chemistry, WV Wesleyan College, Buckhannon, WV, 26201. Synthesis of chiral and achiral cobalt complexes for hydrogenation studies.

Catalytic hydrogenation reactions have diverse applications in the petrochemical, food, pharmaceutical, and agricultural industries for the efficient synthesis of useful molecules. Specifically, asymmetric hydrogenation of olefins is a key method in the synthesis of single-enantiomer products necessary for the pharmaceutical industry, in particular. However, precious metals such as ruthenium, rhodium, and iridium are the basis for many of the current catalysts. It would be advantageous to replace these more expensive and toxic metals with first-row transition metals that are abundant and environmentally compatible. In addition, most catalytic systems for asymmetric hydrogenation are supported by phosphine ligands. Thus, chiral nitrogen-based ligands provide an opportunity to investigate a relatively underexplored area of hydrogenation chemistry. To this end, we are pursuing cobalt complexes supported by chiral nitrogen-based ligands. The synthesis of a previously reported chiral nitrogen ligand, (R,R)-2,6-bis[1-(*N*-piperidinyl)ethyl]pyridine, is underway with characterization by NMR spectroscopy. Upon successful synthesis of the ligand, cobalt complexes will be targeted in order to investigate asymmetric hydrogenation reactivity. In addition, synthesis of cobalt complexes bearing the achiral congener ligand, $pip_2NNN$ [$pip_2NNN$ = 2,6-bis(piperidylmethyl)pyridine], is underway in order to compare reactivity of chiral versus achiral complexes.