

Asymmetric Catalytic Hydroamination of Ligands Derived from Phenols and Primary Amines

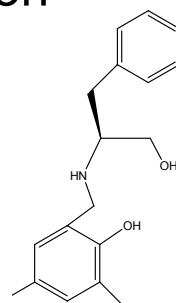
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The summer goal of the lab was to synthesize ligands that bind to Ti and act as a catalyst to improve enantioselectivities in the intramolecular hydroamination reaction of aminoallenes. What makes these ligands different is the fact that they are potentially tridentate, binding through the nitrogen and both oxygens.

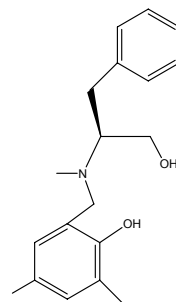
The goal of my project was to synthesize these new ligands that have a Phenylalanine ethyl ester group and either a 4,6-dimethylphenol group or a 4,6-di-*tert*-butylphenol group. This is different than past ligands in the sense that they are bigger and bulkier, which in past experiments, tend to produce higher enantioselectivities.

After synthesizing these four ligands using air sensitive techniques, I characterized them at each step of the synthesis via Carbon 13 NMR, Proton NMR, MS, Polarimetry, and Elemental analysis. In order to fully characterize them, I first had to make sure these ligands were as pure as possible (> 95% pure).

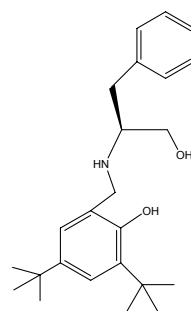
After synthesizing these ligands, I had enough time to bind the 4,6-dimethyl H₃L ligand to Ti. The Proton NMR of this complex was different from what was expected leading us to believe that the ligand possibly correlated to Ti differently than expected. This is just a theory and further investigation will be needed in the future to unravel this mystery compound.



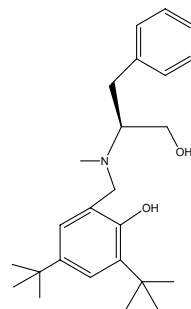
a



b



c



d

- a) 4,6-dimethyl-phenol H₃L Ligand
- b) 4,6-dimethyl-phenol N-methyl Ligand
- c) 4,6-di-*tert*-butylphenol H₃L Ligand
- d) 4,6-di-*tert*-butylphenol N-methyl Ligand