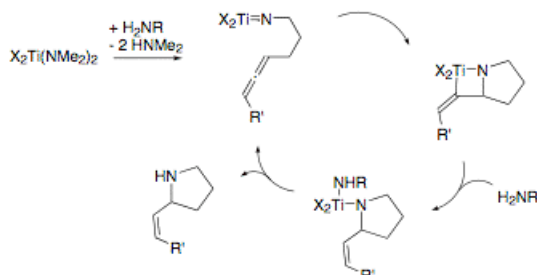


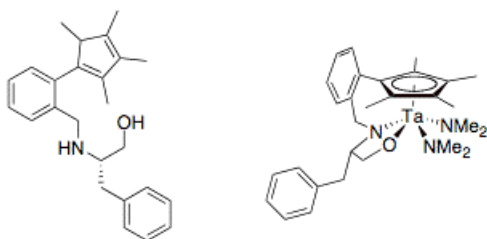
Synthesis of multidentate chiral ligands for stereocontrol of asymmetric hydroamination

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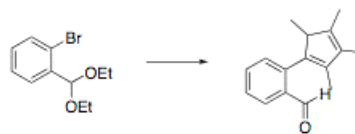
Background Hydroamination is the addition of a nitrogen-carbon bond across a carbon-carbon double bond. Kinetically the reaction is not favored, so catalysts must be used to give reasonable reaction rates. Catalysts are composed of ligands coordinated to metal centers. Intramolecular hydroamination results in the production of two enantiomers.



A tethered chiral ligand catalyst would have increased rigidity and steric bulk from previous catalysts used. This rigidity and bulk would hopefully force the aminoallene substrate to coordinate to the catalyst via only one pathway, resulting in the production of only one enantiomer.



Current Work The experimental work during summer 2008 focused on the synthesis of the chiral ligand. This synthesis involves two major steps: coupling the tetramethyl-cyclopentadiene (Cp) to the benzyl group, and coupling the benzyl group to the phenylalaninol. A successful synthesis approach, shown below, was found for the Cp-benzyl coupling step. This synthesis resulted in a moderately high purity product in 36% yield.



The bulk of phenylalaninol greatly impeded the second step of the reaction, reductive amination between the aldehyde and the amine. However, product was observed in low yield in some cases.

Future Work

- optimize conditions for first coupling
- Refine reductive amination
- Use less bulky amine groups to encourage coupling

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