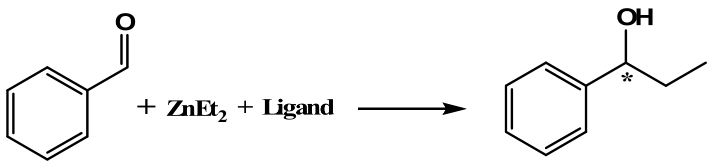
Titanium Ligand Catalyzed Reactions

Lauren Hughs and Adam Johnson

Though chemically equivalent, enantiomers sometimes react differently in our bodies. Because of this, it is becoming extremely important to develop chemical processes that result in optically pure products. The Johnson Lab coordinates chiral amino acid derived ligands to titanium compounds for use as catalysts in organometallic reactions. The presence of these catalysis improves reaction rates and the optical purity of the products

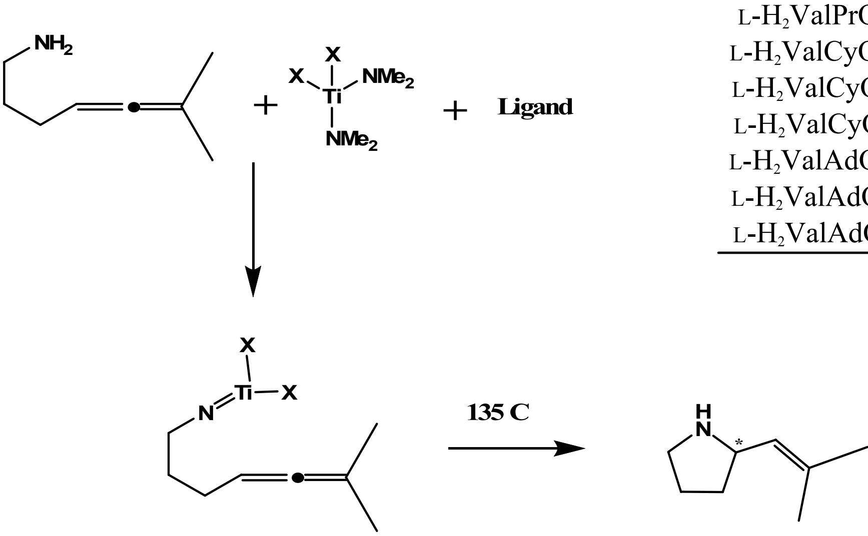
- The Benzaldehyde reaction
- This reaction was used as a screen to identify which ligands catalyzed the most enantioselective reactions.
- % ee was determined using chiral gas chromatography



- Ligand catalysts were also used in a hydroamination reaction.

Ligand	ee	Ligand	ee
L-H_2ValPrOMe_2	2	L-H_2PhePrOMe_2	4
L-H_2ValPrOBu_2	5	L-H_2PhePrOBu_2	3
L-H_2ValPrOPh_2		L-H_2PhePrOPh_2	
L-H_2ValCyOMe_2	1	L-H_2PheCyOMe_2	1
L-H_2ValCyOBu_2	1	L-H_2PheCyOBu_2	5
L-H_2ValCyOPh_2	5	L-H_2PheCyOPh_2	16
L-H_2ValAdOMe_2		L-H_2PheAdOMe_2	
L-H_2ValAdOBu_2	10	L-H_2PheAdOBu_2	1
L-H_2ValAdOPh_2	0	L-H_2PheAdOPh_2	7

Hydroamination Reaction



All starting materials are in solutions of deuterobenzene
Reactions are carried our in J. Young NMR tubes

Thanks to ACS PRF, Harvey Mudd College and My lab mates