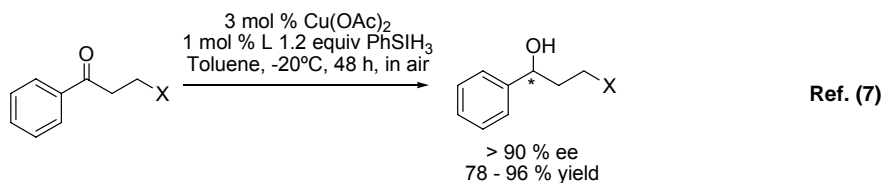
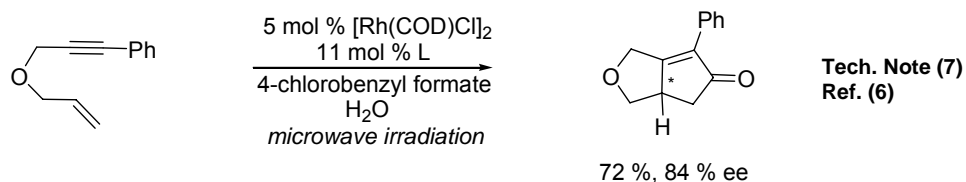
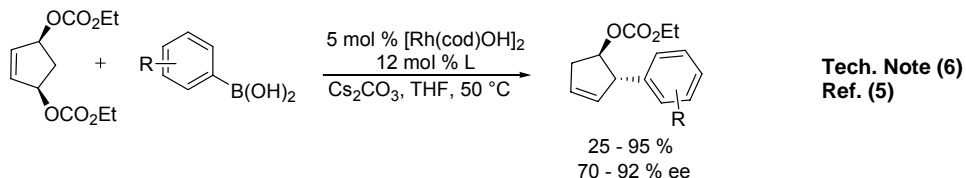
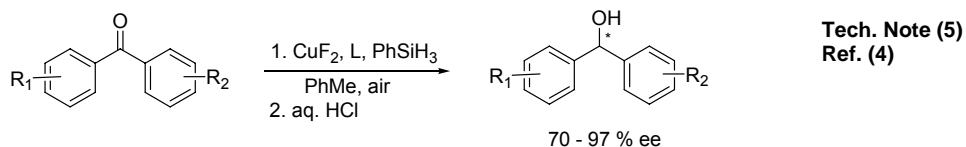
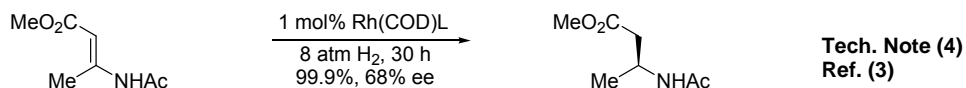
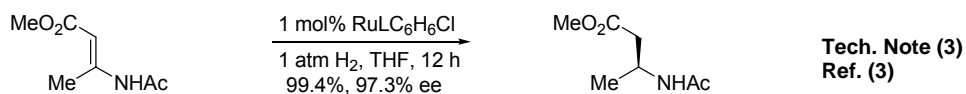
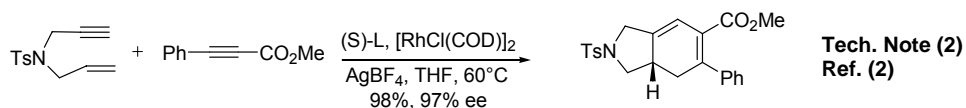
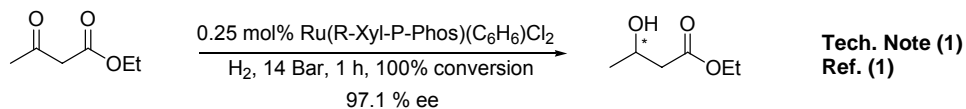


Catalog # 15-5211 (S)-(-)-2,2',6,6'-Tetramethoxy-4,4'-bis(di(3,5-xylyl)phosphino)-3,3'-bipyridine, min. 95% CTH-(S)-Xylyl-P-Phos

Note: Sold in collaboration with Johnson Matthey for research purposes only. US patent Application No US Patent 5 886 182, 1999 and patents arising therefrom.

Technical Notes:

1. Chiral ligand for the asymmetric hydrogenation of  $\beta$ -keto esters.
2. Chiral ligand for enantioselective rhodium-catalyzed [2+2+2] carbocyclization reactions.
3. Chiral ligand for ruthenium catalyzed hydrogenation of (E)- $\beta$ -(acylamino)acrylates to  $\beta$ -amino acids.
4. The Rhodium complex gives higher enantioselectivity for hydrogenation of (Z)- $\beta$ -(acylamino)acrylates to  $\beta$ -amino acids.
5. Chiral ligand for copper-catalyzed asymmetric hydrosilylation of ketones.
6. Chiral ligand for asymmetric allylic substitution reactions using boronic acids as nucleophiles.
7. Gives useful selectivity in asymmetric Pauson-Khand-type cyclizations.



References:

1. *Tetrahedron Lett.*, **2002**, 43, 1539.
2. *J. Am. Chem. Soc.*, **2005**, 127, 12466.
3. *J. Org. Chem.*, **2003**, 68, 2490.
4. *Proc. Nat. Acad. Sci.*, **2005**, 102, 3570.
5. *Org. Lett.*, **2006**, 8, 4569.
6. *Synlett.*, **2008**, 10, 1553.
7. *Chem. Eur. J.*, **2011**, 17, 14234.