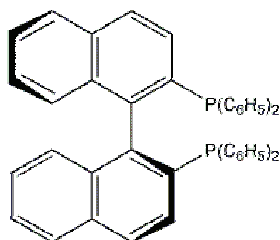


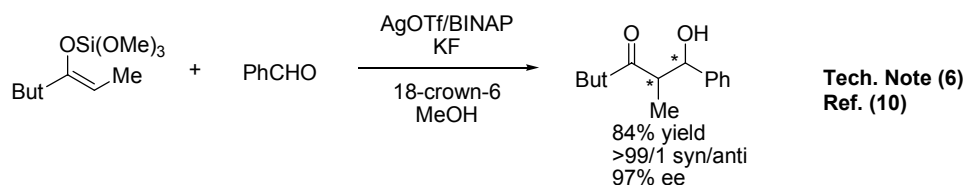
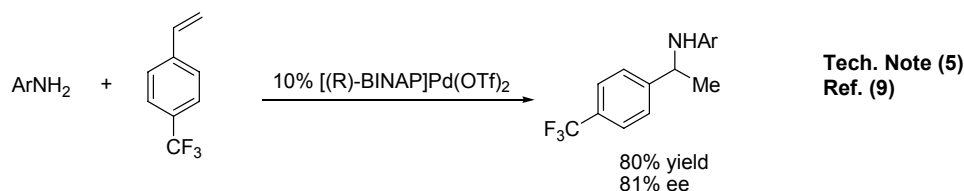
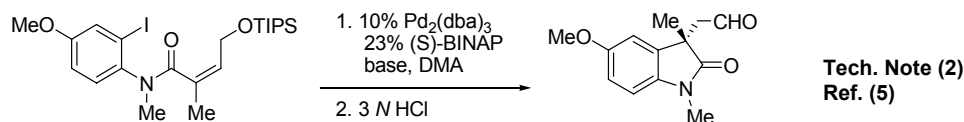
Catalog # 15-0151 (S)-(-)-2,2'-Bis(diphenylphosphino)-1,1'-binaphthyl, 97% (S)-BINAP [76189-56-5]

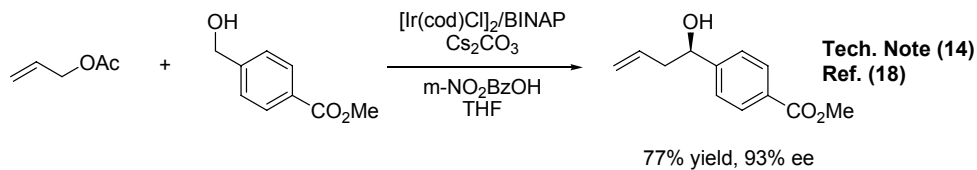
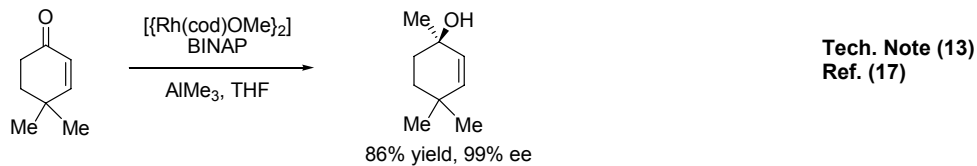
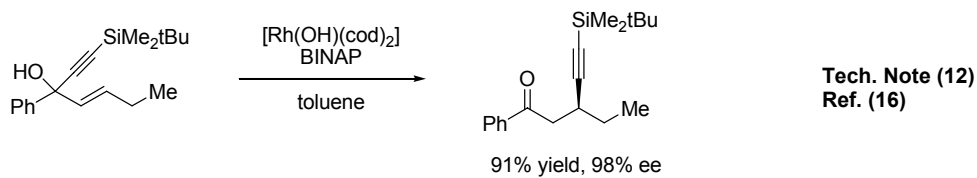
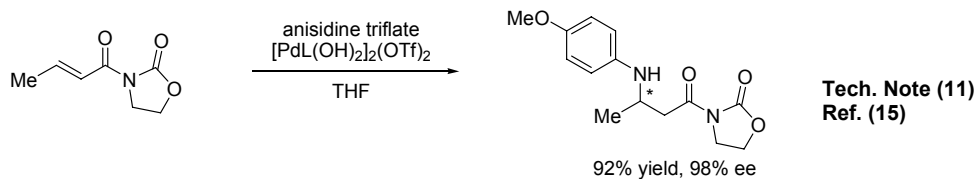
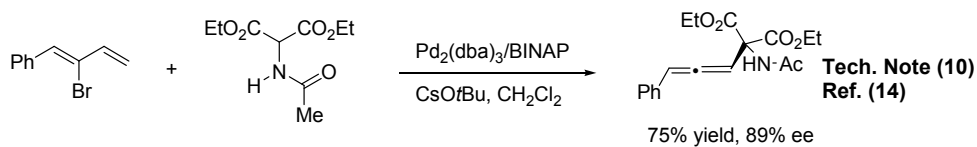
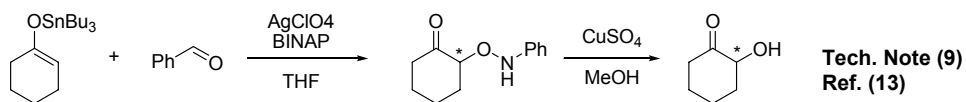
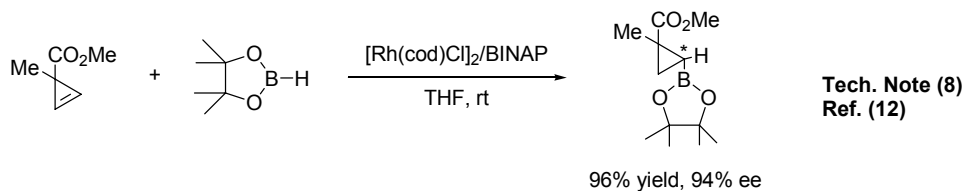
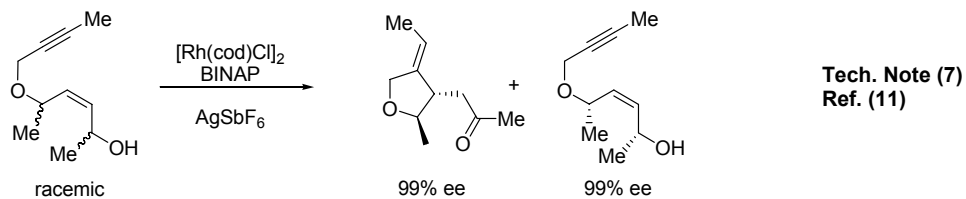
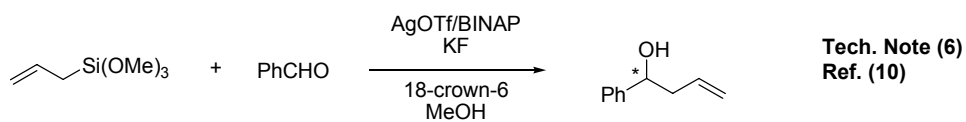


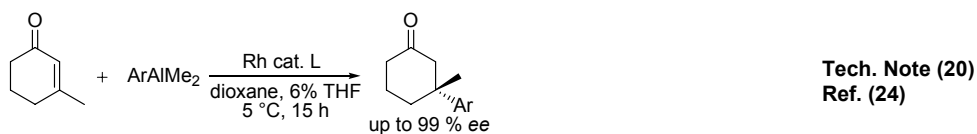
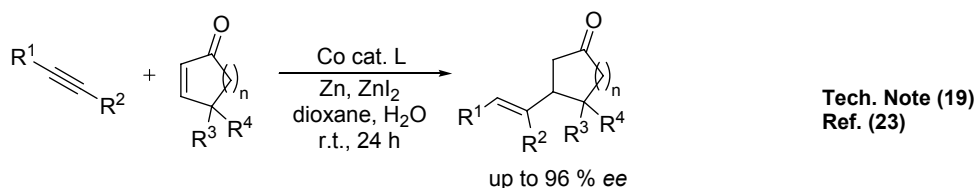
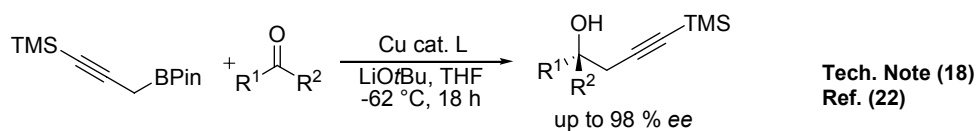
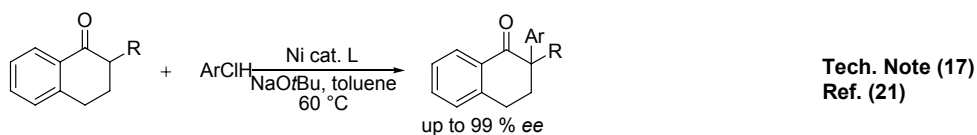
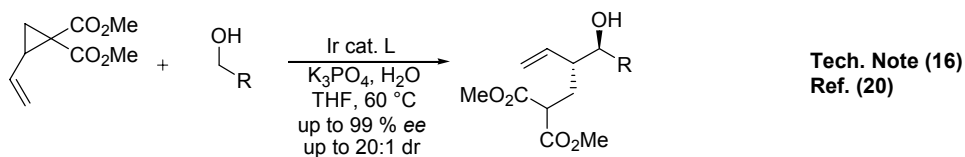
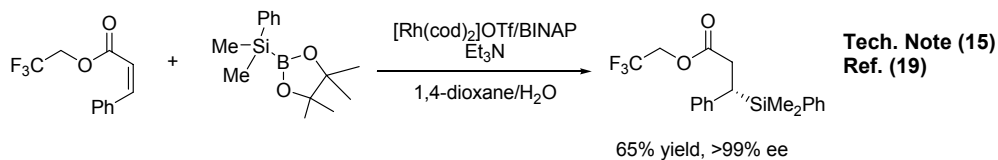
Note: Manufactured under license of Takasago patent. Takasago BINAP Ligand Kit component.

Technical Notes:

1. (R)-BINAP or (R)-Tol-BINAP can be combined with dichloro(1,5-cyclooctadiene)ruthenium to form precursors to NOYORI CATALYST SYSTEMS. These systems exhibit very high catalytic activity and enantioselectivity in the hydrogenation of a wide range of substrates. NOYORI CATALYST SYSTEMS have been shown to effect highly enantioselective hydrogenation of functionalized ketones where the substituents are dialkylamino, hydroxy, siloxy, carbonyl, ester, amide or thioester.
2. Useful ligand in asymmetric Heck processes.
3. Ligand employed in palladium-catalyzed asymmetric arylation of ketones.
4. Ligand employed in rhodium-catalyzed 1,4-additions to enones.
5. Ligand employed in palladium-catalyzed hydroamination of styrene derivatives.
6. Ligand employed in silver-catalyzed asymmetric Sakuri-Hosomi allylation and Mukaiyama aldol reaction.
7. Ligand employed in rhodium-catalyzed kinetic resolution of enynes.
8. Ligand employed in asymmetric rhodium-catalyzed hydroboration of cyclopropenes.
9. Ligand employed in silver-catalyzed  $\alpha$ -hydroxylation of stannyl enol ethers.
10. Ligand employed in palladium-catalyzed synthesis of chiral allenes.
11. Ligand for palladium-catalyzed enantioselective hetero Michael addition to form  $\beta$ -amino acid derivatives.
12. Ligand employed in rhodium-catalyzed asymmetric rearrangement of alkynyl alkenyl carbinols.
13. Ligand employed in rhodium-catalyzed 1,2-addition of aluminium organyl compounds to cyclic enones.
14. Ligand employed in iridium-catalyzed transfer hydrogenative allylation of benzylic alcohols.
15. Ligand employed in rhodium-catalyzed asymmetric C-Si bond formation by conjugate silyl transfer using a Si-B linkage.
16. Ligand employed in the iridium-catalyzed asymmetric cyclopropane-mediated carbonyl allylation of primary alcohols.
17. Ligand employed in the nickel-catalyzed asymmetric  $\alpha$ -arylation of tetralones.
18. Ligand employed in the copper-catalyzed asymmetric propargylation of ketones.
19. Ligand employed in the cobalt-catalyzed asymmetric reductive coupling of alkynes with alkenes.
20. Ligand employed in the rhodium-catalyzed asymmetric 1,4-addition of arylalanes on trisubstituted enones.







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