Synthesis of Optically Active β- or γ-Alkyl Substituted Alcohols through Copper-Catalyzed Asymmetric Allylic Alkylation with Organolithium Reagents

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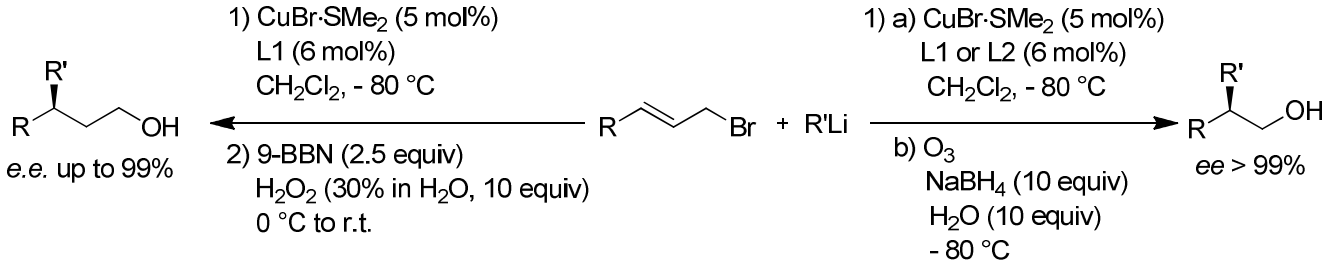
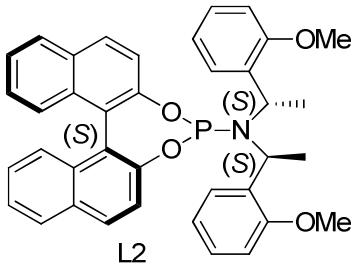
Optically active β- or γ-alkyl substituted primary alcohols are key intermediates in total synthesis of natural products. Several methodologies have been developed for the construction of these building blocks based on chiral auxiliaries,[1] resolution methods,[2] etc. However the development of a catalytic asymmetric protocol is still challenging for the synthesis of these alcohols. Recently our group reported the first Cu-catalyzed asymmetric allylic alkylation (AAA) with highly reactive organolithium reagents with excellent regio- and high enantioselectivity.[3,4] Herein we report the combination of Cu-catalyzed AAA and reductive ozonolysis in one pot protocol to afford optically active β-alkyl substituted alcohols and in combination of Cu-catalyzed AAA with a hydroboration oxidation reaction to achieve optically active γ-alkyl substituted alcohols.





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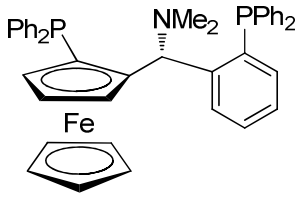

L1, (+)-(*R*,*R*$_p$)-Taniaphos

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