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Highly Enantioselective Nickel-Catalyzed Intramolecular Hydroalkenylation of N- and O-Tethered 1,6-Dienes to Form Six-Membered Heterocycles

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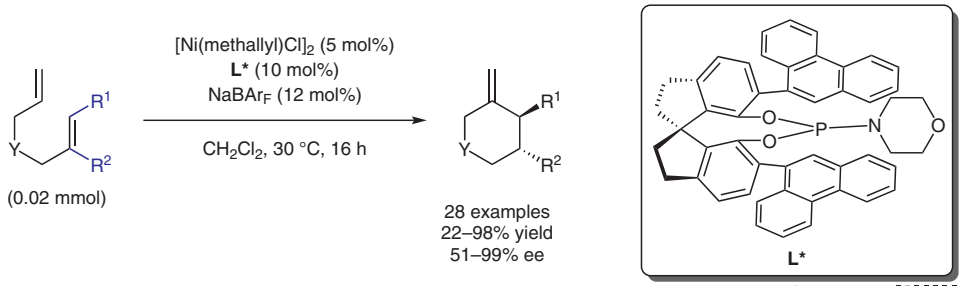
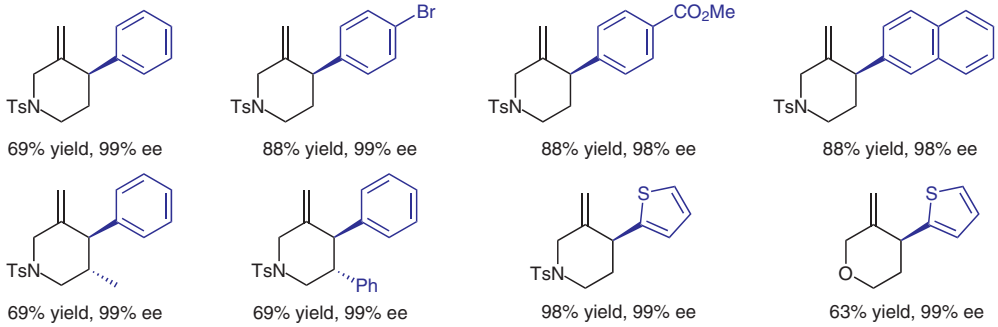
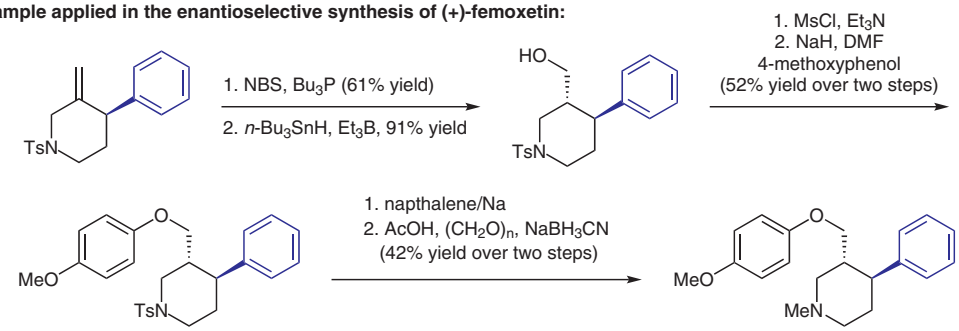
Asymmetric Nickel-Catalyzed Intramolecular Hydroalkenylation



Selected examples:



Example applied in the enantioselective synthesis of (+)-femoxetin:



Significance: Nickel catalysis has been explored in recent years as a cost-effective alternative to palladium. Zhu, Zhou, and co-workers report the enantioselective nickel-catalyzed isomerizations of dienes to yield chiral piperidines or tetrahydropyrans, which are found in a number of natural products and drug structures.

Comment: The reaction was proposed to involve a nickel-hydride intermediate, which was generated through β-hydride elimination of the alkyl nickel species. The approach was successful with a variety of substituents on the olefin, and all the reactions proceeded with high enantioselectivities.

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Category

Metal-Catalyzed Asymmetric Synthesis and Stereoselective Reactions

Key words

nickel catalysis

hydroalkenylation

piperidines