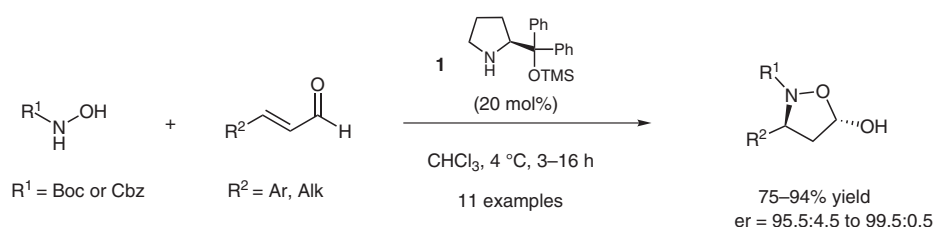


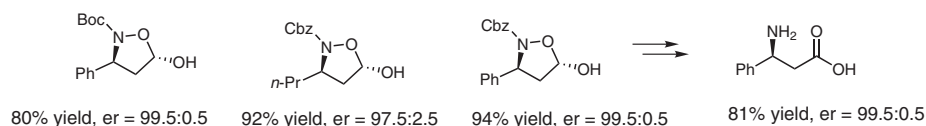
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Organocatalytic Asymmetric 5-Hydroxyisoxazolidin Synthesis: A Highly Enantioselective Route to β -Amino Acids
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Organocatalytic Asymmetric Synthesis of 5-Hydroxyisoxazolidines



Selected examples:



Significance: Here the authors report a highly enantioselective tandem conjugate-addition–hemiacetal-formation reaction between *N*-protected hydroxylamines and enals leading to an efficient entry to 5-hydroxyisoxazolidines. TMS-protected diphenylprolinol **1** has been found to be the best catalyst for this reaction. With 20 mol% of catalyst **1**, good to high yields (75–94%) and excellent enantioselectivities (er = 95.5:4.5 to 99.5:0.5) are obtained for different enals with *N*-Cbz- or *N*-Boc-protected hydroxylamines. In addition, the authors have developed a simple preparation of γ -amino alcohols and β -amino acids from their reaction products.

Comment: 5-Hydroxyisoxazolidines are important chiral building blocks because of their utility in the preparation of chiral γ -amino alcohols and β -amino acids. While a Lewis acid catalyzed enantioselective synthesis of 5-hydroxyisoxazolidines is known, chiral amine catalyzed syntheses have not been reported previously. The in situ oxidation of the products to the 5-isoxazolidinones and two-step conversion into β -amino acids with preservation of optical purity also looks attractive.

Category

Organo- and Biocatalysis

Key words

domino reaction

5-hydroxyisoxazolidines

amine catalysis

enantioselectivity

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of the month

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