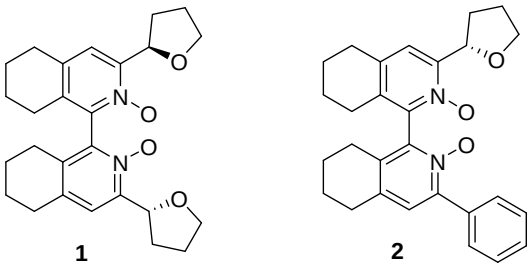
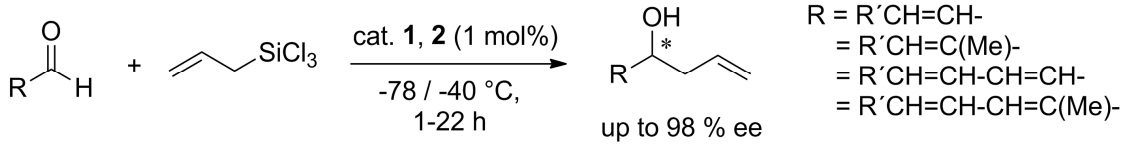
Abstract

Novel bis(tetrahydroisoquinoline) *N*,*N*´-dioxides **1**,**2** belong to the group of compounds with axial chirality that act as a Lewis base. These properties make them useful chiral catalysts in reactions such as allylation, opening of epoxides, etc. that exhibit high enantioselectivity.

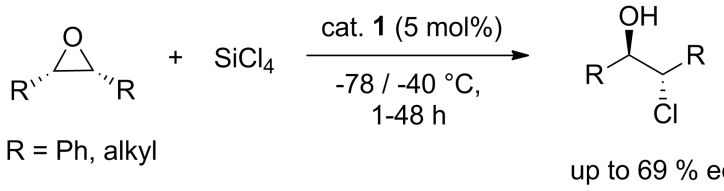
The prepared chiral bis(tetrahydroisoquinoline) *N*,*N*´-dioxides (*R*,R_{ax},*R*)-**1**, (*R*,S_{ax},*R*)-**1**, (R_{ax},*R*)-**2** a (S_{ax},*R*)-**2** were tested as catalysts in enantioselective allylation of variously substituted α,β–unsaturated aldehydes and dienals with allyltrichlorosilane (Scheme 1). All the catalysts exhibited high catalytic activity as well as high asymmetric induction (up to 96% for α,β-unsaturated aldehydes;[1] up to 98 % for dienals). Appropriate choice of solvent as a reaction medium[3,4] and substitution in α-position in aldehydes were the crucial factors for the successful course of the reaction. The catalytic activity of (*R*,R_{ax},*R*)-**1** and (*R*,S_{ax},*R*)-**1** was also tested in asymmetric opening of *meso*-epoxides with tetrachlorosilane (ee up to 69 %) (Scheme 2).



Scheme 1



Scheme 2



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