Category

Metal-Catalyzed Asymmetric Synthesis and Stereoselective Reactions

Key words

α,β-unsaturated γ-keto esters

γ-butenolides

***N,N′*-dioxides**

Michael addition

scandium

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N,N′-Dioxide–Scandium(III)-Catalyzed Asymmetric Michael Addition of β,γ-Unsaturated Butenolides to α,β-Unsaturated γ-Keto Esters

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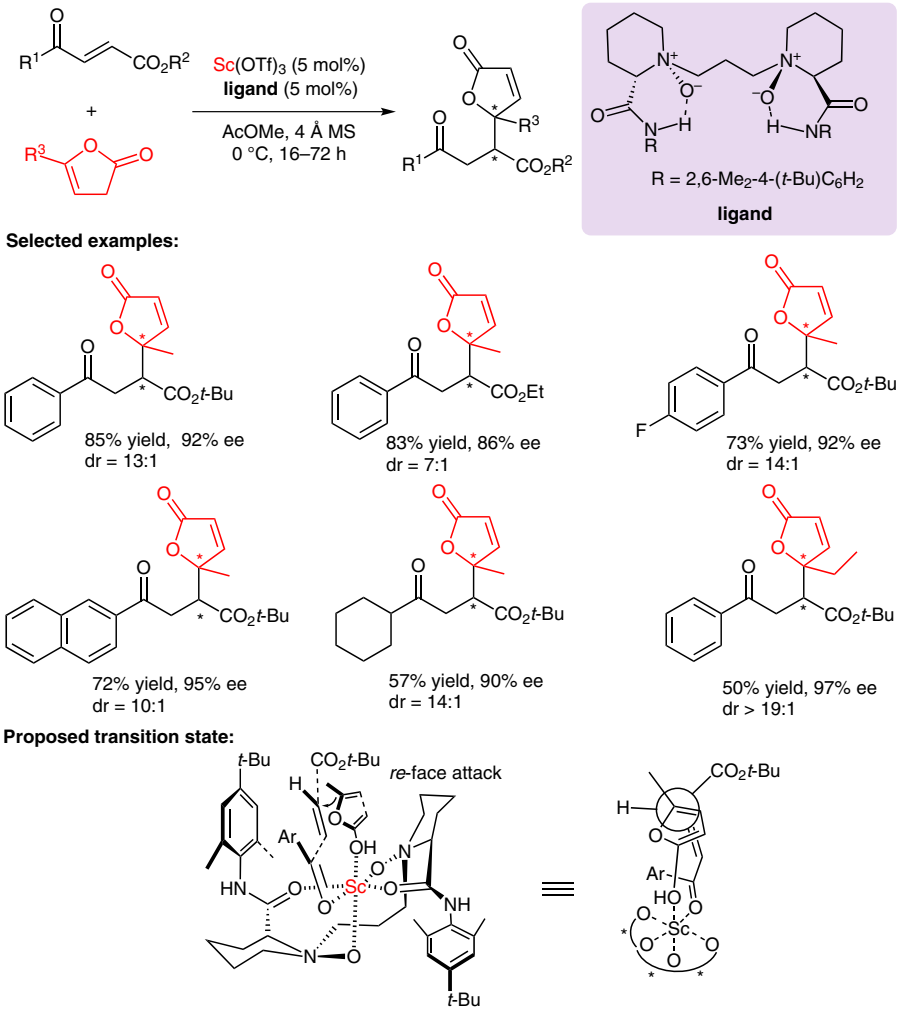
N,N′-Dioxide–Scandium(III)-Catalyzed Asymmetric Michael Addition



Significance: Butenolide derivatives represent an important structural motif in natural products and pharmaceuticals. The authors develop a highly efficient catalytic system for the asymmetric vinylogous Michael addition of γ-substituted butenolides to α,β-unsaturated γ-keto esters, leading to γ,γ-disubstituted butenolides in good yield and excellent enantioselectivities.

Comment: The substrate scope of this reaction is well investigated. The ester groups of the α,β-unsaturated γ-keto esters display an influence on both diastereo- and enantioselectivity. The bulkier γ-substituted groups in the butenolides lead to the increase of diastereo- and enantioselectivity, but the reactivities decrease obviously. Aromatic and aliphatic unsaturated γ-keto esters are well tolerated.

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