SYNFACTS

Highlights in Current
Synthetic Organic
Chemistry

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Thieme

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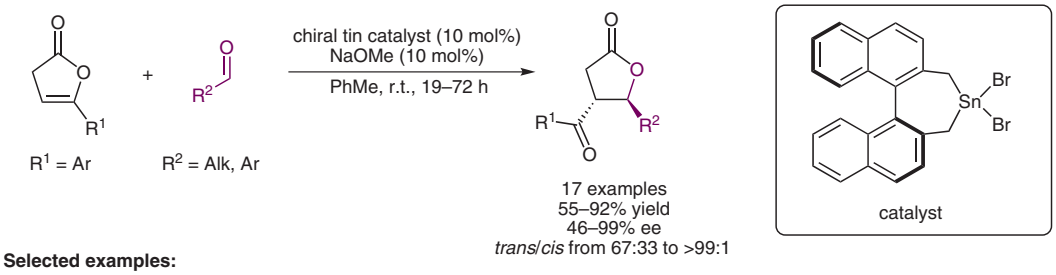
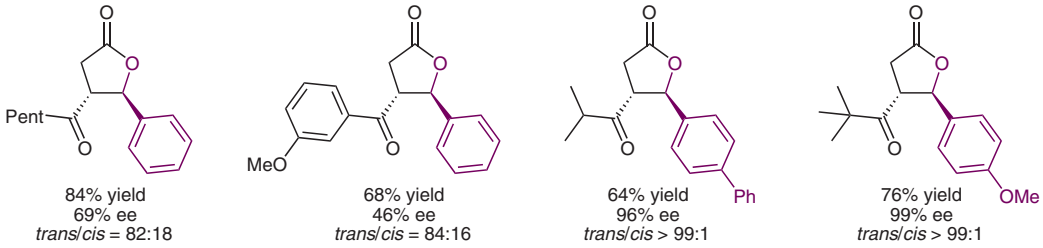
Catalytic Enantioselective Synthesis of Chiral γ-Butyrolactones

Org. Lett. **2011**, *13*, 1576-1578.

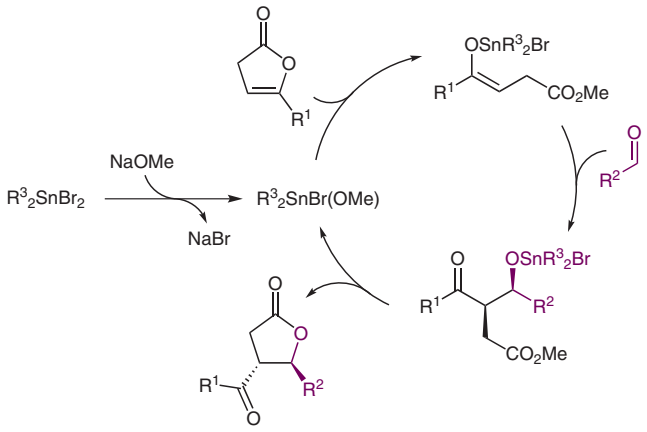
Synthesis of Chiral γ-Butyrolactones by a Domino Aldol–Cyclization Reaction



Selected examples:



Proposed mechanism:



Significance: Chiral lactones are found in numerous biologically active natural products and are useful precursors for the synthesis of many interesting molecules. Based on their previous work on asymmetric tin-catalyzed aldol reactions (*Chem. Eur. J.* **2009**, *15*, 11450), the authors have developed a domino approach to prepare γ-butyrolactones in good yields, regio- and enantioselectivity.

Comment: The regio- and enantioselectivity were both found to be highest when a bulky aliphatic aldehyde was used, such as isobutyraldehyde or pivaldehyde. A catalytic amount of sodium methoxide was found to be necessary, and is proposed to form the active tin bromide methoxide complex. The use of two equivalents of methoxide to tin gave no reaction, suggesting the tin dimethoxide is catalytically inactive.

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