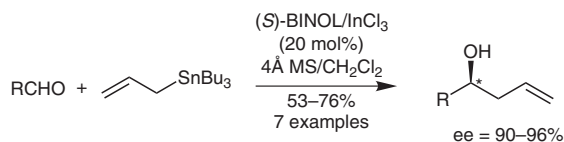


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Catalytic Asymmetric Allylation of Aldehydes via a Chiral Indium(III) Complex

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## Asymmetric Allylation of Aldehydes Catalyzed by a Chiral Indium(III)-BINOL Complex



**Significance:** The first chiral indium(III)-catalyzed allylation reaction of aldehydes is disclosed. By using catalytic  $\text{InCl}_3$ /(S)-BINOL, highly enantioselective formation of homoallylic alcohols was achieved using allyltributylstannane.

**Comments:** This allylation protocol developed is relatively simple, mild and affords excellent enantioselectivity with both aromatic and aliphatic aldehydes. The most likely drawback is the high toxicity of organotin reagents. Further studies to determine the scope of the reaction with a variety of aromatic aldehydes is required. Preliminary mechanistic studies revealed that the active chiral Lewis acid catalyst is a BINOL-In(III)-allyl complex. There are many asymmetric allylation reagents or allylation catalysts present in the literature (for a review see: S. E. Denmark, J. Fu *Chem. Rev.* **2003**, *103*, 2763-2794).

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