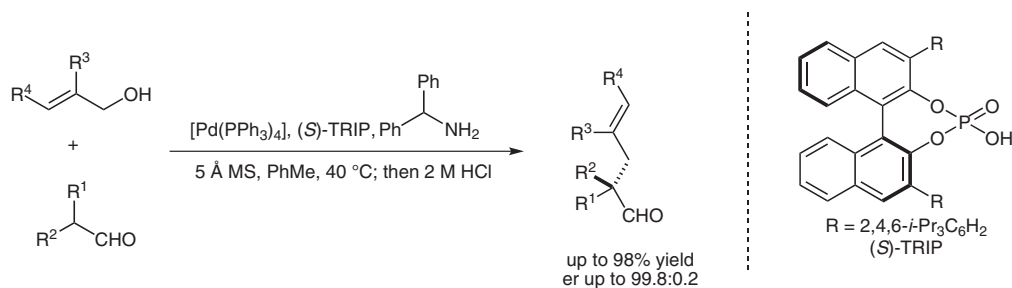


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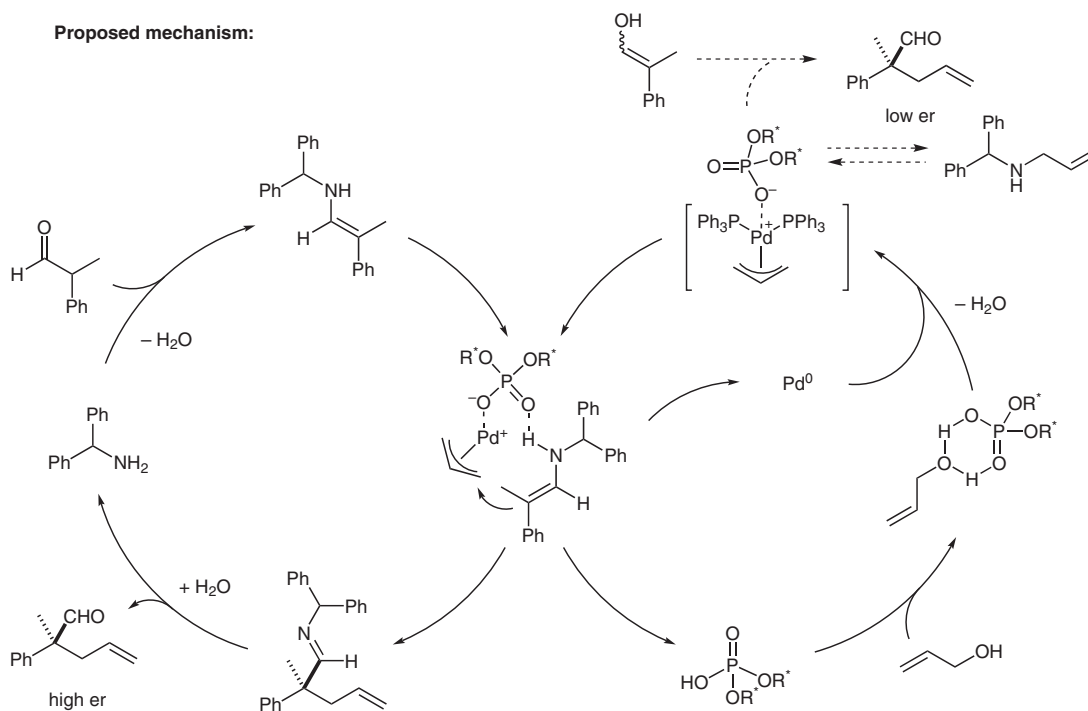
Direct Asymmetric  $\alpha$ -Allylation of Aldehydes with Simple Allylic Alcohols Enabled by the Concerted Action of Three Different Catalysts

*Angew. Chem. Int. Ed.* **2011**, *50*, 9471-9474.

## Asymmetric $\alpha$ -Allylation of Aldehydes with Simple Allylic Alcohols



Proposed mechanism:



**Significance:** List and co-workers developed an enantioselective direct  $\alpha$ -allylation of  $\alpha$ -branched aldehydes with allylic alcohols generating products with all-carbon quaternary stereogenic centers in high yields and excellent enantioselectivities. The general reaction scale for this transformation is 0.2 mmol.

**Comment:** It is suggested that the high enantioselectivity for the described transformation arises from an asymmetric counteranion-directed catalysis (ACDC) complex – three different catalytic species are involved: [Pd(PPh<sub>3</sub>)<sub>4</sub>], the chiral Brønsted acid TRIP, and benzhydryl amine.

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palladium

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