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Enantio- and Diastereoselective Synthesis of *syn*- β -Hydroxy- α -vinyl Carboxylic Esters via Reductive Aldol Reactions of Ethyl Allenecarboxylate with 10-TMS-9-Borabicyclo[3.3.2]decane and DFT Analysis of the Hydroboration Pathway

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Stereoselective Synthesis of *syn*- β -Hydroxy- α -vinyl Carboxylate Esters

R = Ph, Cy, $(\text{CH}_2)_2\text{Ph}$, CH_2OTBDPS , CHCHPh , 3-pyridyl, 2-furyl

Selected examples:

Significance: The authors report a novel enantio- and diastereoselective synthesis of *syn*- β -hydroxy- α -vinyl carboxylate esters. The reaction proceeds via a reductive aldol reaction of an ethyl allene carboxylate with 10-TMS-9-borabicyclo[3.3.2]decane.

Comment: The exclusive formation of *syn*- β -hydroxy- α -vinyl carboxylate esters can be explained by an aldol reaction via a chair-like transition state. DFT calculations suggest that the allene hydroboration involves a 1,4-reduction of the ethyl allene carboxylate with 10-TMS-9-borabicyclo[3.3.2]decane.

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