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Metal-Free Hydrogenation of Electron-Poor Allenes and Alkenes
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Frustrated Lewis Pairs for Catalytic Hydrogenation of Allenes and Alkenes

Electron-rich allenenes:

Electron-poor allenenes and alkenes:

Mechanistic studies:

Significance: The Alcarazo group reports a frustrated Lewis pair (FLP)-catalyzed hydrogenation reaction of electron-poor allenenes and alkenes. The reduced products were obtained with good to excellent yield and high chemoselectivity by employing $\text{DABCO-B}(\text{C}_6\text{F}_5)_3$ as a catalyst pair (10–15 mol%).

Comment: To overcome the inherent reactivity of electron-rich allenenes to cyclize to Friedel-Crafts products **1** in the presence Brønsted acids and/or Lewis acids, the authors employ electron-poor substrates to facilitate FLP-catalyzed hydrogenation to the desired product **2**. According to the mechanistic studies, $[\text{DABCO-H}]^+$ might act as a hydrogen-bond donor to activate the substrate. The hydride from the borohydride is transferred via 1,4-addition.

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