Iron-Catalyzed Asymmetric Hydrosilylation of 1,1-Disubstituted Alkenes

Significance: Chiral organosilicon compounds have important applications in selective C–C bond-forming reactions. While an asymmetric alkene hydrosilylation provides a direct route to such scaffolds, the use of 1,1-disubstituted alkenes is rather elusive. For a racemic example, see: J. Am. Chem. Soc. 2004, 126, 13794. Herein, Bart et al. present a highly enantioselective method for the anti-Markovnikov hydrosilylation of 1,1-disubstituted alkenes catalyzed by an iron complex.

Comment: The substrate scope is quite broad with a variety of ortho-, meta- and para-substituted aryl rings tolerated on the alkene. Sensitive aldehyde and ketone functionalities must first be protected as the acetal or ketal. In addition to the use of styrene derivatives, aliphatic 1,1-disubstituted olefins could be applied. The authors demonstrate that the products can be further functionalized to yield chiral 3-substituted Si- or O-containing rings.

Selected examples:

Further derivatizations:

SYNFACTS Contributors: Mark Lautens, Christine M. Le

Synfacts 2015, 11(5), 0497 Published online: 17.04.2015
DOI: 10.1055/s-0034-1380562; Reg-No.: L03415SF