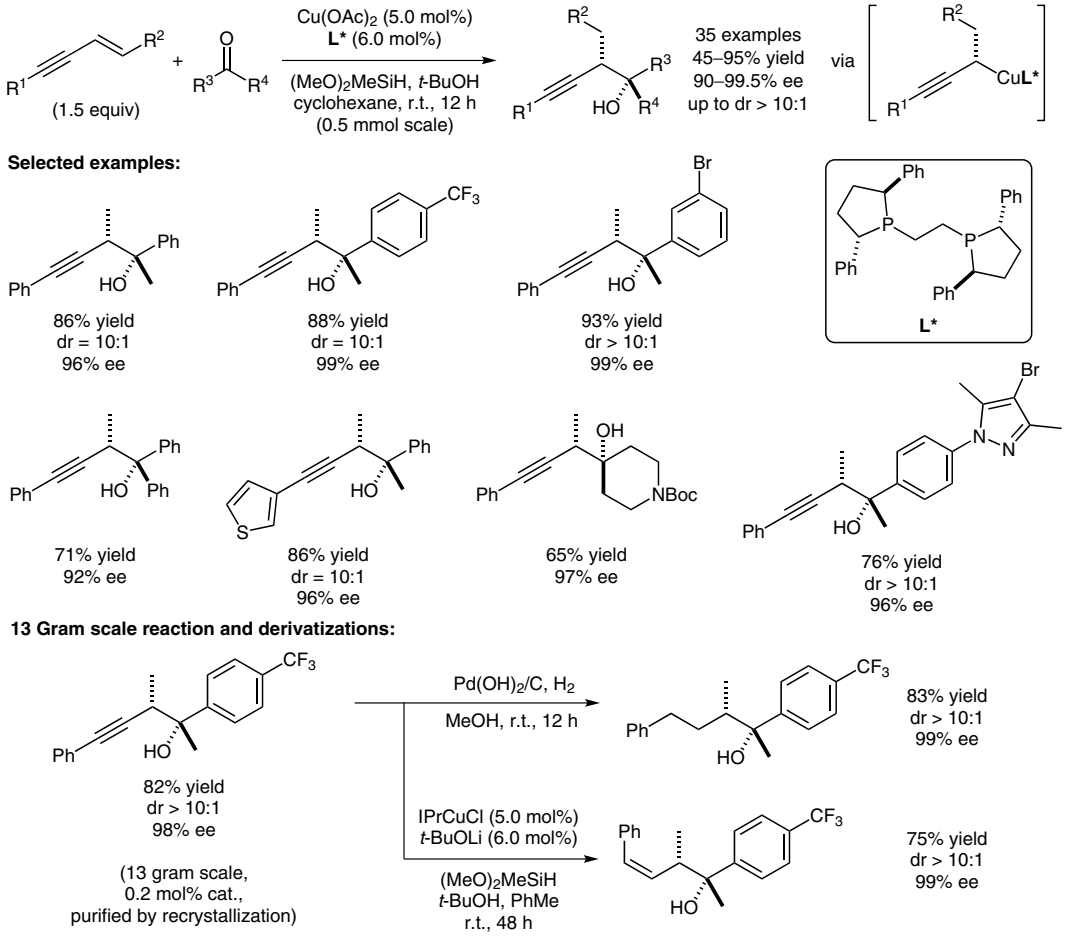
Y. YANG, I. B. PERRY, G. LU, P. LIU,* S. L. BUCHWALD* (UNIVERSITY OF PITTSBURGH AND MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, USA)
Copper-Catalyzed Asymmetric Addition of Olefin-Derived Nucleophiles to Ketones
Science **2016**, *353*, 144–150.

Copper-Catalyzed Asymmetric Nucleophilic Addition to Ketones



Significance: Enantioenriched alcohols represent a recurring structural motif in biologically active molecules and pharmaceuticals. The synthesis of this class of compounds usually relies on the addition of nucleophiles to carbonyl compounds. The limitations of this approach in terms of functional-group tolerance and versatility prompted the authors to develop a novel copper-catalyzed asymmetric addition of nucleophiles, generated in situ from olefins, to ketones.

Comment: A chiral copper catalyst promoted the reaction between a number of enyne substrates with ketones. $(MeO)_2MeSiH$ and *t*-BuOH are required to generate the nucleophile in situ and to terminate the catalytic cycle, respectively. The reaction delivers the corresponding chiral alcohols in good yields and excellent enantioselectivities. A 13 gram scale reaction, derivatizations of the final products and applications in the synthesis of pharmaceutical agents were provided. Furthermore, computational studies were carried out to explain the observed enantio- and diastereoselectivity.

SYNFACTS Contributors: Mark Lautens, Ivan Franzoni
Synfacts 2016, 12(09), 0923 Published online: 18.08.2016
DOI: 10.1055/s-0035-1561902; **Reg-No.:** L08516SF

Category

Metal-Catalyzed Asymmetric Synthesis and Stereoselective Reactions

Key words

copper catalysis

asymmetric reaction

1,2-addition

silane reagents