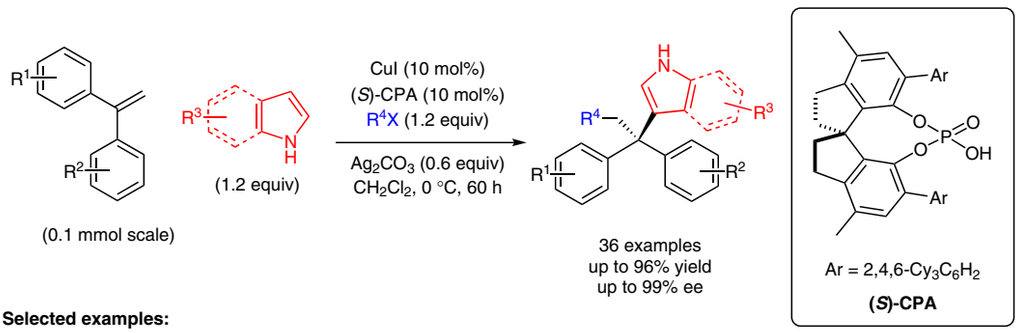
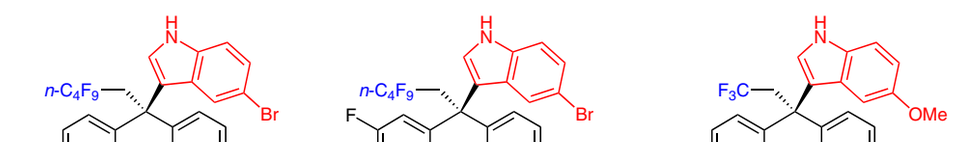
J. S. LIN, T. T. LI, J.-R. LIU, G.-Y. JIAO, Q.-S. GU, J.-T. CHENG, Y.-L. GUO, X. HONG*, X.-Y. LIU* (SOUTHERN UNIVERSITY OF SCIENCE AND TECHNOLOGY, SHENZHEN AND ZHEJIANG UNIVERSITY, HANGZHOU, P. R. OF CHINA)

Cu/Chiral Phosphoric Acid-Catalyzed Asymmetric Three-Component Radical-Initiated 1,2-Dicarbofunctionalization of Alkenes
J. Am. Chem. Soc. **2019**, *141*, 1074–1083.

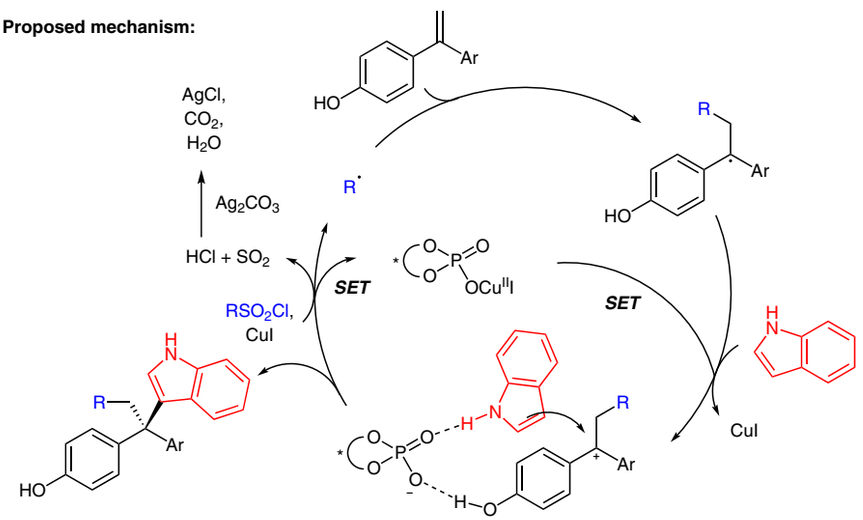
Asymmetric 1,2-Dicarbofunctionalization of Alkenes with Copper/Chiral Phosphoric Acid System



Selected examples:



Proposed mechanism:



Significance: Owing to their ready availability, asymmetric dicarbofunctionalization of alkenes remains an important topic in catalysis. The authors report a three-component asymmetric difunctionalization of 1,1-disubstituted alkenes with a radical initiator and heteroaryl nucleophile using copper and chiral phosphoric acid (CPA) catalyst.

Comment: The reaction proceeds through a Kharasch-type addition across the unactivated olefin, whereupon the resultant tertiary radical undergoes a SET to form a tertiary cation. The CPA's H-bonding affects the facial selectivity of the attack of the indole moiety in an asymmetric fashion to form the products.

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Category

Metals in Synthesis

Key words

copper catalysis

chiral phosphoric acids

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