J. CHEN, X. GONG, J. LI, Y. LI, J. MA, C. HOU, G. ZHAO, W. YUAN*, B. ZHAO* (SHANGHAI NORMAL UNIVERSITY AND CHENGDU INSTITUTE OF ORGANIC CHEMISTRY, P. R. OF CHINA)
Carbonyl Catalysis Enables a Biomimetic Asymmetric Mannich Reaction
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Category

Organo- and Biocatalysis

Key words

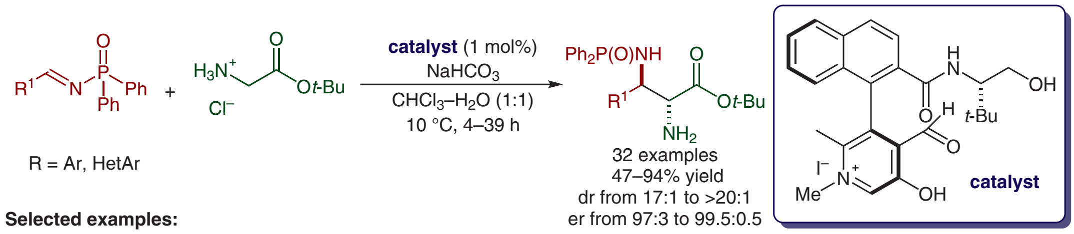
carbonyl catalysis

Mannich reaction

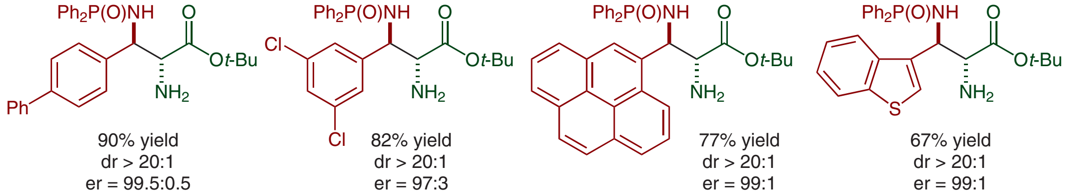
pyridoxal

α,β-diamino acid esters

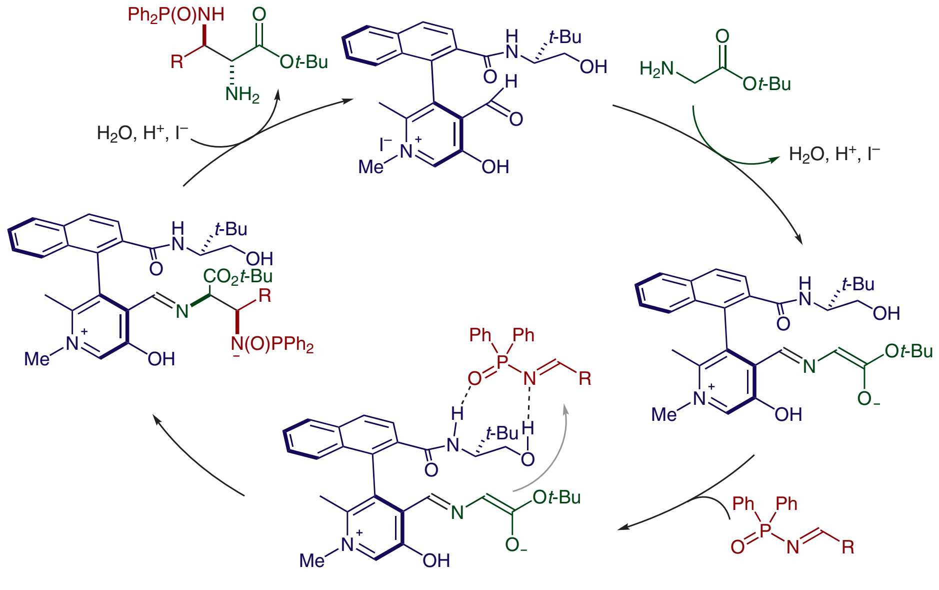
Carbonyl-Catalyzed Biomimetic Asymmetric Mannich Reaction



Selected examples:



Proposed reaction mechanism:



Significance: The Zhao group reports the activation of primary amines by carbonyls. Using an N-quaternized pyridoxal catalyst for the direct asymmetric Mannich reaction of glycinate with aryl *N*-diphenylphosphinyl imines, α,β-diamino acid esters were obtained in good yields and excellent stereoselectivities.

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Comment: Based on their recently developed chiral pyridoxal and pyridoxamine catalysts for transamination reactions (*J. Am. Chem. Soc.* **2016**, *138*, 10730), the authors developed a catalyst that activates primary amines through carbonyl catalysis. In contrast to other α-functionalizations of primary amines, this fascinating catalysis strategy does not require protecting-group manipulation.