

Chiral Lewis Base Catalyzed Aldol Reaction of Unprotected Carboxylic Acids

Category

Organo- and Biocatalysis

Key words

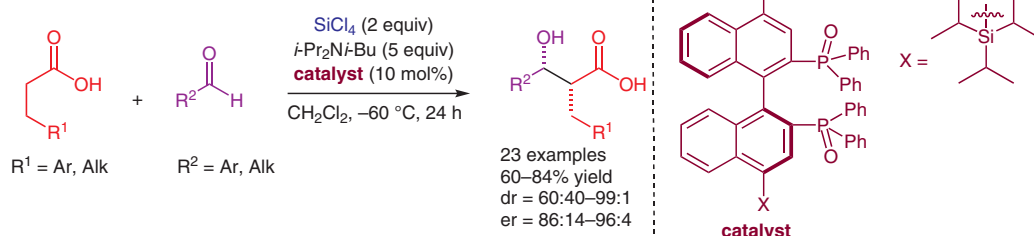
aldol reaction

phosphine oxides

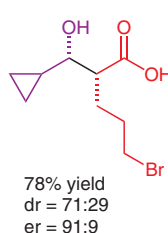
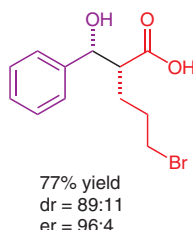
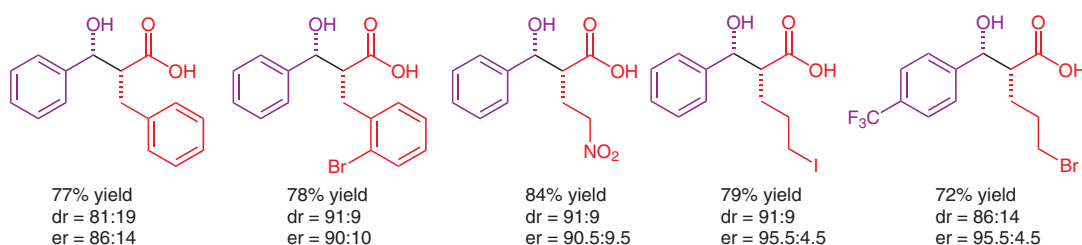
Lewis base catalysis

carboxylic acids

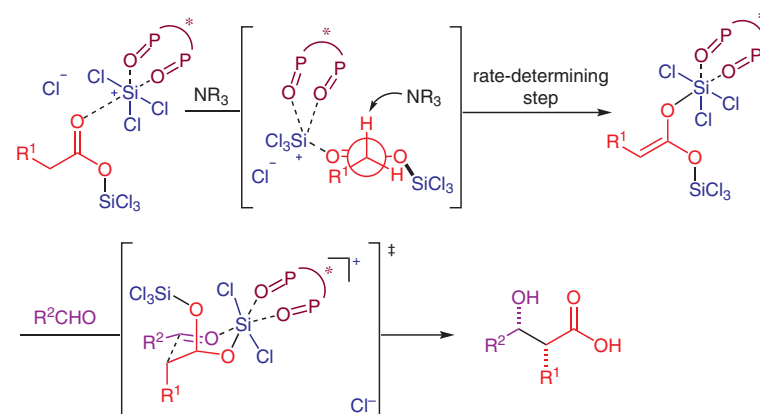
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Selected examples:



Plausible stereochemical pathway:



Significance: Nakajima and co-workers report the first example of a chiral Lewis base-catalyzed SiCl_4 -mediated enantioselective aldol reaction of unprotected carboxylic acids. The method is highly enantio- and diastereoselective, and it shows a broad substrate scope.

Comment: Previous works on asymmetric aldol reactions of unprotected carboxylic acids by various groups (see, for example: K. Yu et al. *J. Am. Chem. Soc.* **2017**, *139*, 527) required stoichiometric chiral reagents to achieve enantioselectivity, but in the presented method, the authors use SiCl_4 to activate the carboxylic acid, permitting the use of only a catalytic amount of a chiral Lewis base to achieve high enantioselectivity.