Category

Organo- and Biocatalysis

Key words

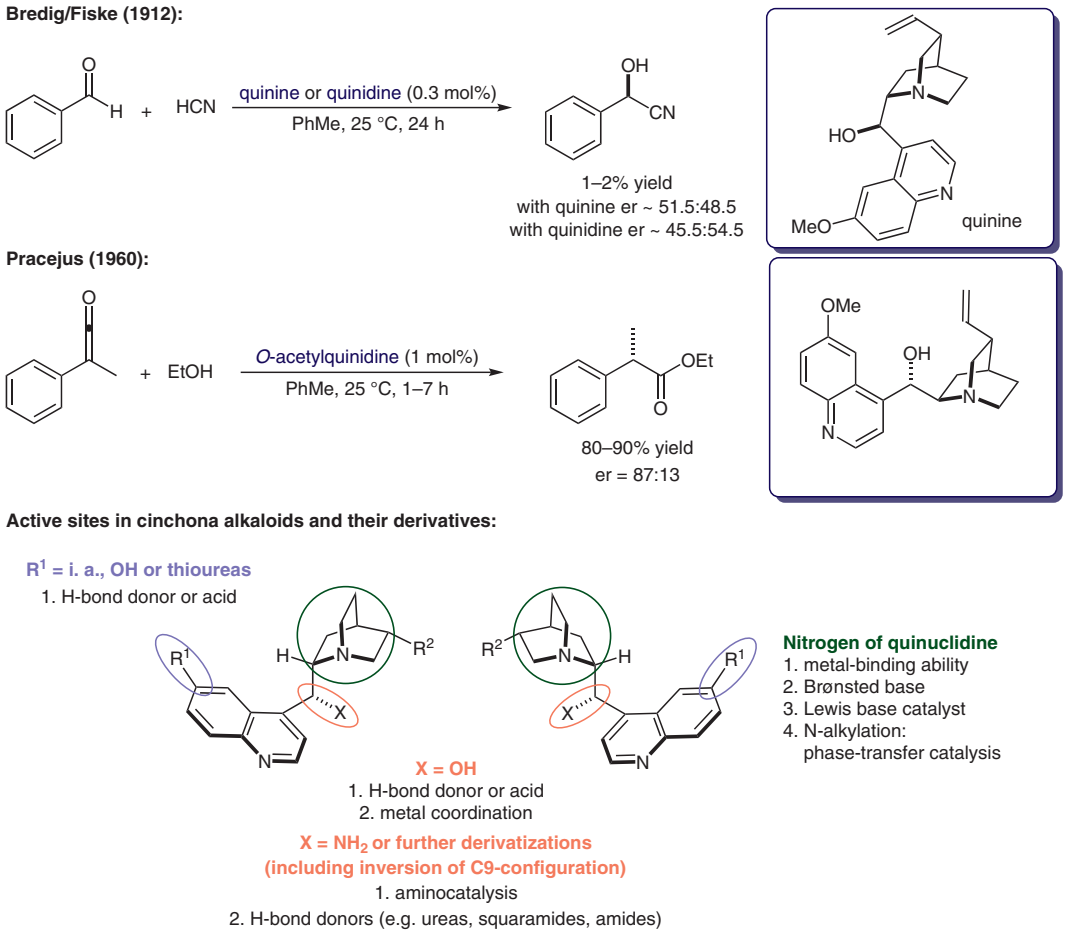
cinchona alkaloids

benzaldehyde

hydrogen cyanide

P. S. FISKE, G. BREDIG* (ETH ZÜRICH, SWITZERLAND)
Durch Katalysatoren bewirkte asymmetrische Synthese
Biochem. Z. **1912**, *687*, 7–23.
H. PRACEJUS* (UNIVERSITÄT ROSTOCK, GERMANY)
Asymmetrische Synthesen mit Ketenen
Justus Liebigs Ann. Chem. **1960**, *634*, 9–22.

Cinchona Alkaloids in Organic Catalysis



Significance: In 1912, Bredig and Fiske published the first example of asymmetric (nonenzymatic) (organo)catalysis. They reported the addition of HCN to benzaldehyde catalyzed by the pseudo-enantiomeric alkaloids quinine and quinidine, with low but reproducible enantioselectivities. About four decades later, Pracejus, for the first time, achieved reasonable enantioselectivities (74% ee) by using *O*-acetylquinine as an organocatalyst. This groundwork paved the way to a variety of cincho-na-alkaloid-catalyzed asymmetric transformations in industry and academia.

Comment: Cinchona alkaloids are among the most privileged asymmetry inducers in the area of enantioselective catalysis. They possess a chiral skeleton that is easily modifiable. In the last century, methodologies were developed in which they were used as chiral bases, as chiral Lewis base catalysts, in ligand-accelerated catalysis, or as quaternized ammonium salts in phase-transfer catalysis, among others. Current research continues to showcase their importance and utility in asymmetric catalysis, for example by incorporating other privileged organic catalophores such as thioureas.

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