

Massachusetts Institute of Technology
Organic Chemistry 5.512

March 24, 2006
Prof. Rick L. Danheiser

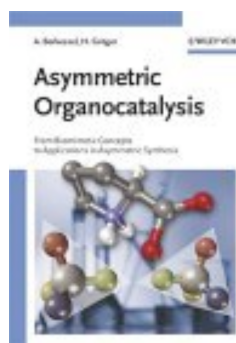
Unit 2
Stereocontrolled Alkylation
and Related Electrophilic Substitution Strategies

V. Catalytic Methods

- ★ α -Oxidation of Aldehydes and Ketones (*H. Yamamoto, MacMillan, Zhong, Y. Hayashi*)
- ★ Alkylation of Imine Derivatives of α -Amino Esters (*O'Donnell, Corey, Maruoka*)
- ★ Tsuji Allylation of Ketones (*Stoltz, Trost*)
- ★ Enantioselective Protonation Strategies (*Fu*)



Special Issue on
Asymmetric Organocatalysis
Accts. Chem. Res. **2004**, 37, 487-631

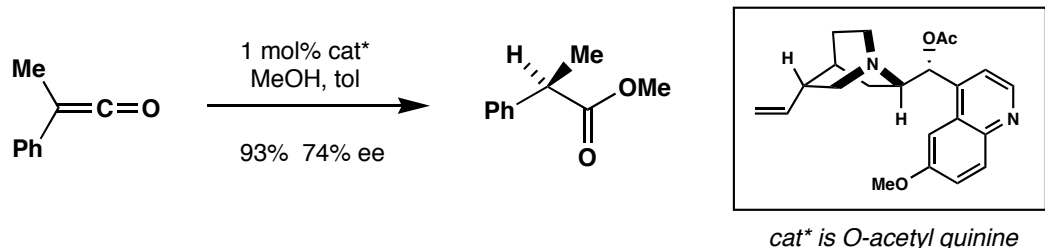


"Asymmetric Organocatalysis"
A. Berkessel and H. Gröger
Wiley-VCH, **2005**

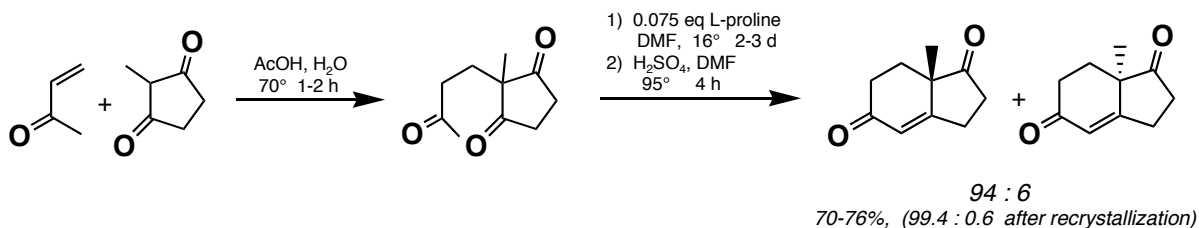
- ★ Catalysis by Enzymes
- ★ Transition Metal Organometallic Catalysis
- ★ "Organocatalysts"

Asymmetric Organocatalysis: Early Milestones

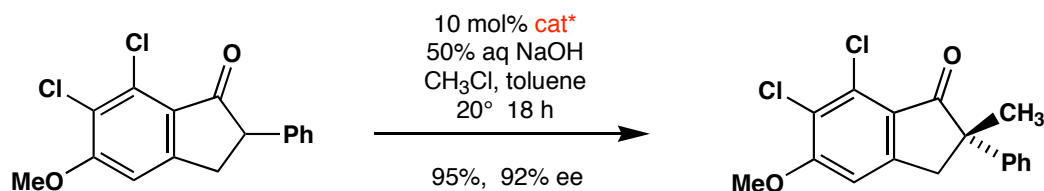
- ★ H. Pracejus *Liebigs Ann. Chem.* **1960**, 634, 9; *J. Prakt. Chem.* **1964**, 24, 195



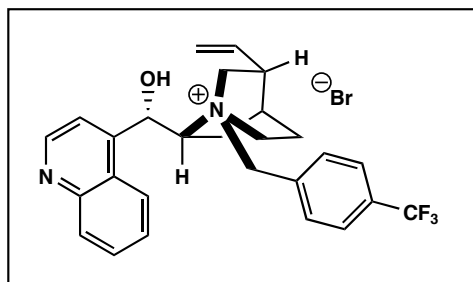
- ★ Z. G. Hajos, D. R. Parrish *J. Org. Chem.* **1974**, 39, 1615; also U. Eder, G. Sauer, and R. Wiechert . . . see *Org. Synth. Coll. Vol.* 7, 363 and 368



- ★ E. J. J. Grabowski et al. *J. Am. Chem. Soc.* **1984**, 106, 446; *J. Org. Chem.* **1987**, 52, 4745



cat^{*}
cinchoninium bromide
derivative



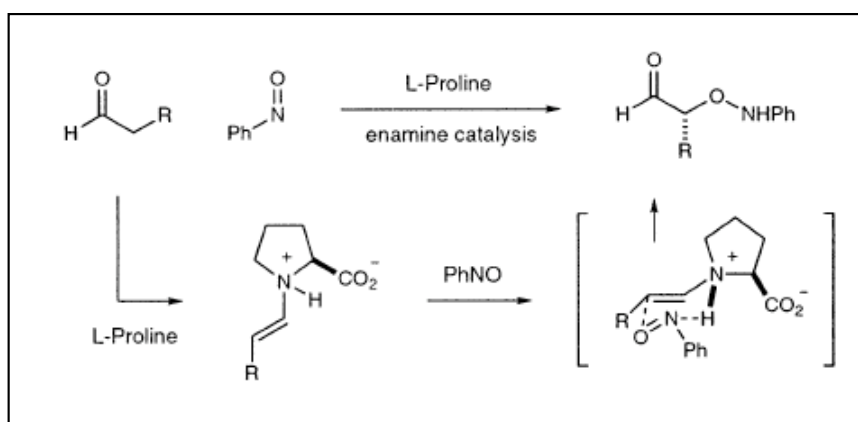
Enantioselective Organocatalytic Oxidation of Aldehydes with Nitrosobenzene



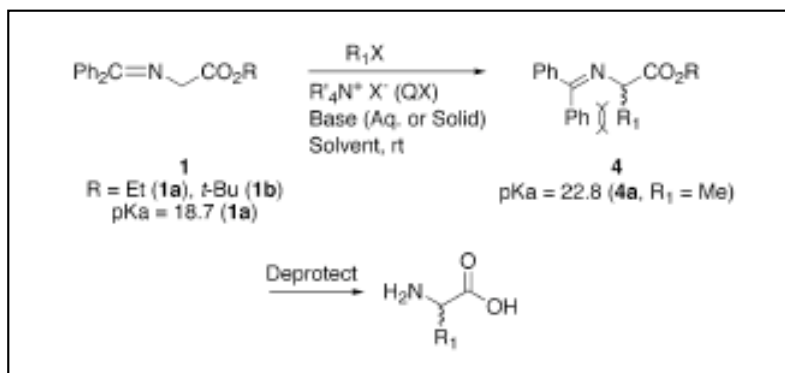
Reviews

Janey, J. M. *Angew. Chem. Int. Ed.* **2005**, 44, 4292

Yamamoto, H.; Momiyama N.
Chem. Commun. **2005**, 3514



Alkylation of Imine Derivatives of α -Amino Esters



Martin J. O'Donnell
IUIPUI