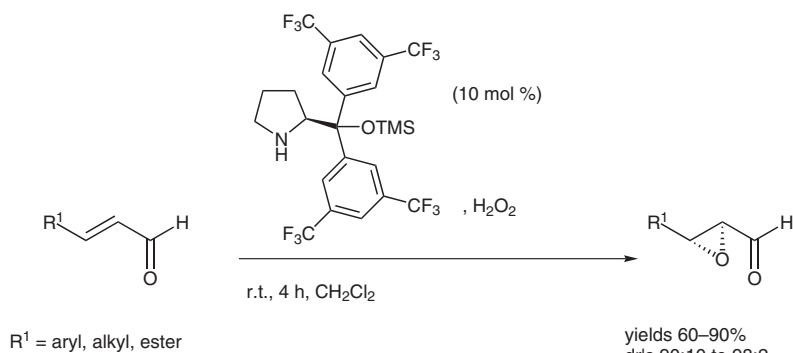


M. MARIGO, J. FRANZEN, T. B. POULSEN, W. ZHUANG, K. A. JØRGENSEN\* (AARHUS UNIVERSITY, DENMARK)

Asymmetric Organocatalytic Epoxidation of  $\alpha,\beta$ -Unsaturated Aldehydes with Hydrogen Peroxide  
*J. Am. Chem. Soc.* **2005**, *127*, 6964-6965.

## Asymmetric Organocatalytic Epoxidation of $\alpha,\beta$ -Unsaturated Aldehydes



**Significance:** Epoxidation has long been an important synthetic transformation in synthetic chemistry. This represents the first direct formation of  $\alpha,\beta$ -epoxy aldehydes which, importantly, was achieved under simple and mild conditions. Hydrogen peroxide was found to be the oxidant of choice while *t*-BuOOH, cumene hydroperoxide, and urea hydrogen peroxide gave similar results, but *m*-CPBA gave almost no conversion (< 3%).

**Comment:** The proposed mechanism involved formation of the iminium ion, which is nucleophilically attacked by the peroxide in 1,4-fashion. The subsequent enamine attacks the electrophilic peroxide oxygen forming the  $\alpha,\beta$ -epoxy aldehyde. This type of activation of  $\alpha,\beta$ -unsaturated carbonyls prompts for promising future studies for asymmetric 1,4-additions (see also: *Angew. Chem. Int. Ed.* **2005**, *44*, 3703-3706).

**SYNFACTS Contributors:** Hisashi Yamamoto, Matthew Boxer  
Synfacts 2005, 0, 0076-0076  
**DOI:** 10.1055/s-2005-869988; **Reg-No.:** H01405SF

2005 © THIEME STUTTGART • NEW YORK