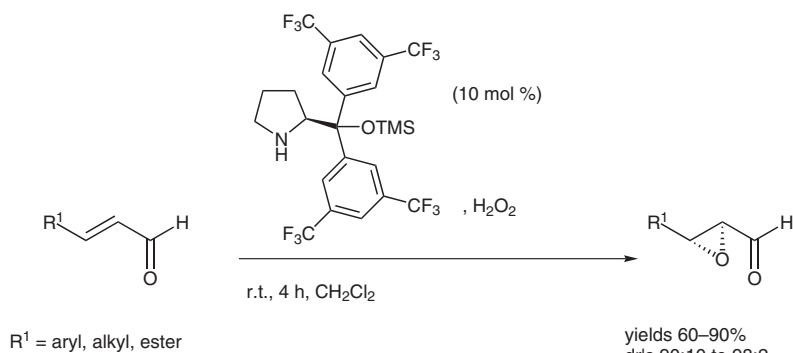


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Asymmetric Organocatalytic Epoxidation of α,β -Unsaturated Aldehydes with Hydrogen Peroxide
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Asymmetric Organocatalytic Epoxidation of α,β -Unsaturated Aldehydes



Significance: Epoxidation has long been an important synthetic transformation in synthetic chemistry. This represents the first direct formation of α,β -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 α,β -epoxy aldehyde. This type of activation of α,β -unsaturated carbonyls prompts for promising future studies for asymmetric 1,4-additions (see also: *Angew. Chem. Int. Ed.* **2005**, *44*, 3703-3706).

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