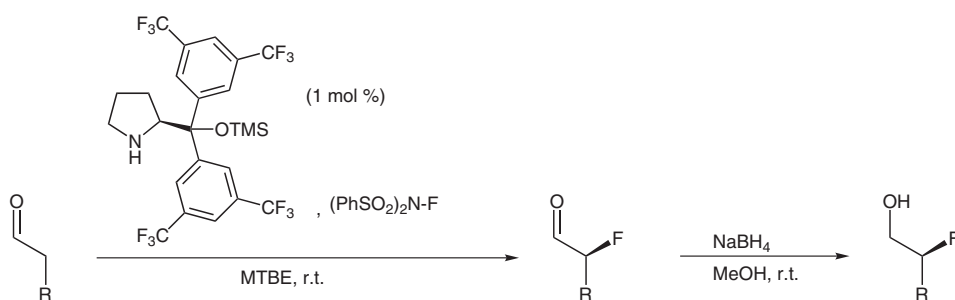


M. MARIGO, D. FIELENBACH, A. BRAUNTON, A. KJÆRSGAARD, K. A. JØRGENSEN\*  
(AARHUS UNIVERSITY, DENMARK)  
Enantioselective Formation of Stereogenic Carbon-Fluorine Centers by a Simple Catalytic Method  
*Angew. Chem. Int. Ed.* **2005**, *44*, 3703-3706.

## Enantioselective Fluorination With a Simple Organic Catalyst



**Significance:** Fluorinated molecules are very important in medicinal, agricultural and materials science. This report is the first asymmetric fluorination of aldehydes with a simple catalyst obtaining extremely high ee's. The use of methyl *tert*-butyl ether as a solvent proved to be critical to reduce difluorination. The use of *N*-fluorodibenzene-sulfonimide (NFSI), which is a commercially available, stable and easy to handle fluoride source, is an excellent complement to the already simple catalyst system. The optically active  $\alpha$ -fluorinated aldehydes were directly reduced to the corresponding  $\alpha$ -fluorinated alcohols since the  $\alpha$ -fluorinated aldehydes are unstable and more volatile than starting materials.

**Comment :** The authors have shown this proline-derived catalyst to be efficient for fluorination under ideal conditions (low catalyst loading, room temperature) for a variety of substrates. The catalyst is believed to operate through fluorination of the enamine intermediate. The proposed reason for the high yields of mono-fluorinated compounds with high ee's is rationalized through shielding of the  $\alpha$ -proton by the bulky aryl groups, prohibiting racemization. For the same catalyst and asymmetric epoxidation see: *J. Am. Chem. Soc.* **2005**, *127*, 6964-6965.

**SYNFACTS Contributors:** Hisashi Yamamoto, Matthew Boxer  
Synfacts 2005, 0, 0075-0075  
**DOI:** 10.1055/s-2005-869987; **Reg-No.:** H01305SF

2005 © THIEME STUTTGART • NEW YORK

Category

Bioorganic  
Chemistry and  
Organocatalysis

Key Words

fluorination  
prolines  
*N*-fluorodibenzene-  
sulfonimide