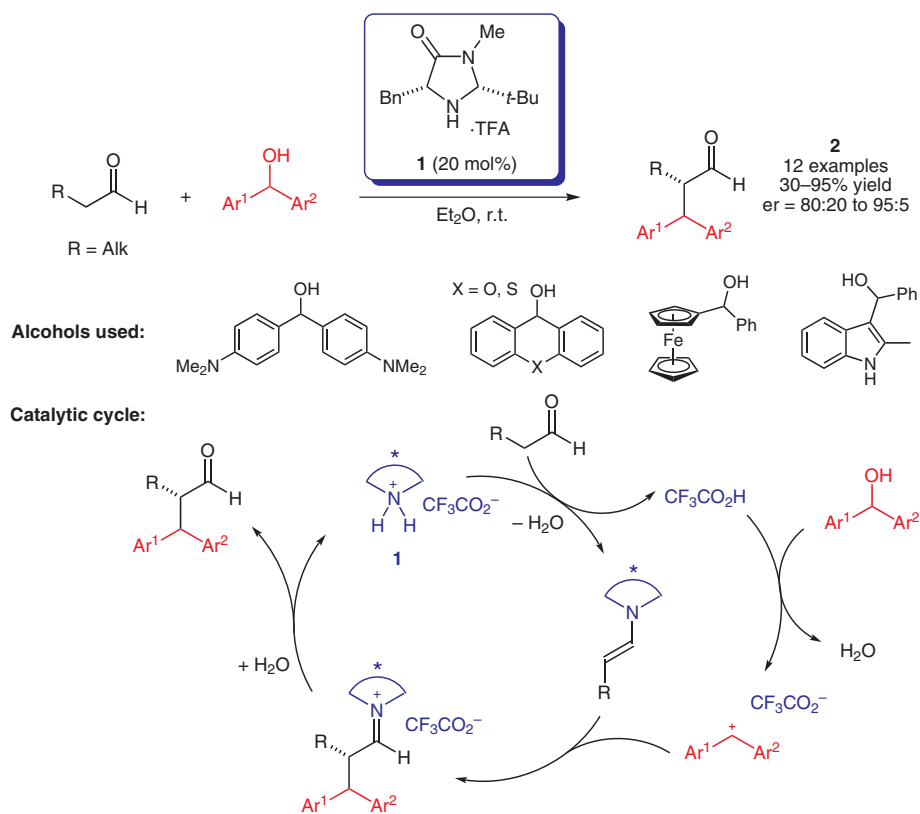


α-Alkylation of Aldehydes by S_N1-Type Reaction of Alcohols



Significance: Alcohols capable of forming stabilized carbocations were used as the alkylating reagents for aldehydes. A catalytic amount of secondary amine salt **1** in Et₂O gave α-alkylated aldehydes **2** in moderate to good yields and good enantioselectivity with H₂O being the only byproduct. In this simple procedure the ammonium salt acts as an aminocatalyst but also as an acid to generate the carbocation from the alcohol.

Comment: The method reported is brilliant but still limited in the scope of the alkylating substrates. The otherwise problematic N-alkylation of the catalyst and the catalytically generated enamine is avoided here because of the reversibility of the reactions with stable carbocations (Mayr and co-workers *Chem. Eur. J.* **2003**, 9, 2209). A similar approach using arylsulfonyl indoles to generate the stabilized carbocations was reported by Melchiorre and co-workers (*Angew. Chem. Int. Ed.* **2008**, 47, 8707). In spite of these reports and the work by the MacMillan group (*Science* **2008**, 322, 77), direct asymmetric introduction of the most useful, simple alkyl substituents to the α-position of the aldehydes remains to be solved.