Enantioselective Homologation of $\alpha$-Keto Esters with $\alpha$-Diazo Esters

**Significance:** The Lewis acid catalyzed homologation of carbonyl compounds with diazo compounds can realize synthetically useful carbon chain extension. The authors achieve the asymmetric homologation of acyclic $\alpha$-keto esters with $\alpha$-diazo esters by using chiral N,N'-dioxide-yttrium(III) complexes. Both aryl- and alkyl-substituted $\alpha$-keto esters are applicable, providing the corresponding succinate derivatives in good yields and enantioselectivities.

**Comment:** The use of bulky adamantyl $\alpha$-diazo esters can suppress the formation of undesired by-products. Steric hindrance on the 2,6-positions of the phenyl ring in the ligand is also essential to improve both enantioselectivity and reactivity. The attack of $\alpha$-diazo ester occurs from re-face of the coordinating $\alpha$-keto ester preferably due to the obstruction of si-face by the aryl group in the N,N'-dioxide ligand.