iminophosphoranes

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Bifunctional Iminophosphorane Organocatalysts for Enantioselective Synthesis: Application to the Ketimine Nitro-Mannich Reaction

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Iminophosphorane-Catalyzed Enantioselective Ketimine Nitro-Mannich Reaction

Synthesis of new BIMP (bifunctional iminophosphorane) organocatalyst:

$$F_3C$$
 NH $+$ Ph_3P Et_2O $r.t., 24 h$ F_3C NH $Brønsted$ base CF_3 H -bond donor

Selected examples:

Significance: Dixon and co-workers report a new class of bifunctional Brønsted base/H-bond donor organocatalyst. The catalyst (bifunctional iminophosphorane, BIMP) can be applied to the ketimine nitro-Mannich reaction, generating β -nitroamines in good to excellent yields and enantioselectivities.

Comment: The authors developed a new catalyst motif consisting of a triaryliminophosphorane moiety as a Brønsted base and a thiourea moiety as an H-bond donor. The catalyst can be easily synthesized via Staudinger reaction of an organoazide and a triarylphospine. The efficiency of the catalyst was demonstrated by the application to the first catalytic enantioselective addition of nitromethane to ketone-derived imines under metalfree conditions. The reaction can be scaled up to multigrams and gives access to enantiomerically pure quaternary α -amino acids.

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