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Highly Chemoselective Metal-Free Reduction of Phosphine Oxides to Phosphines
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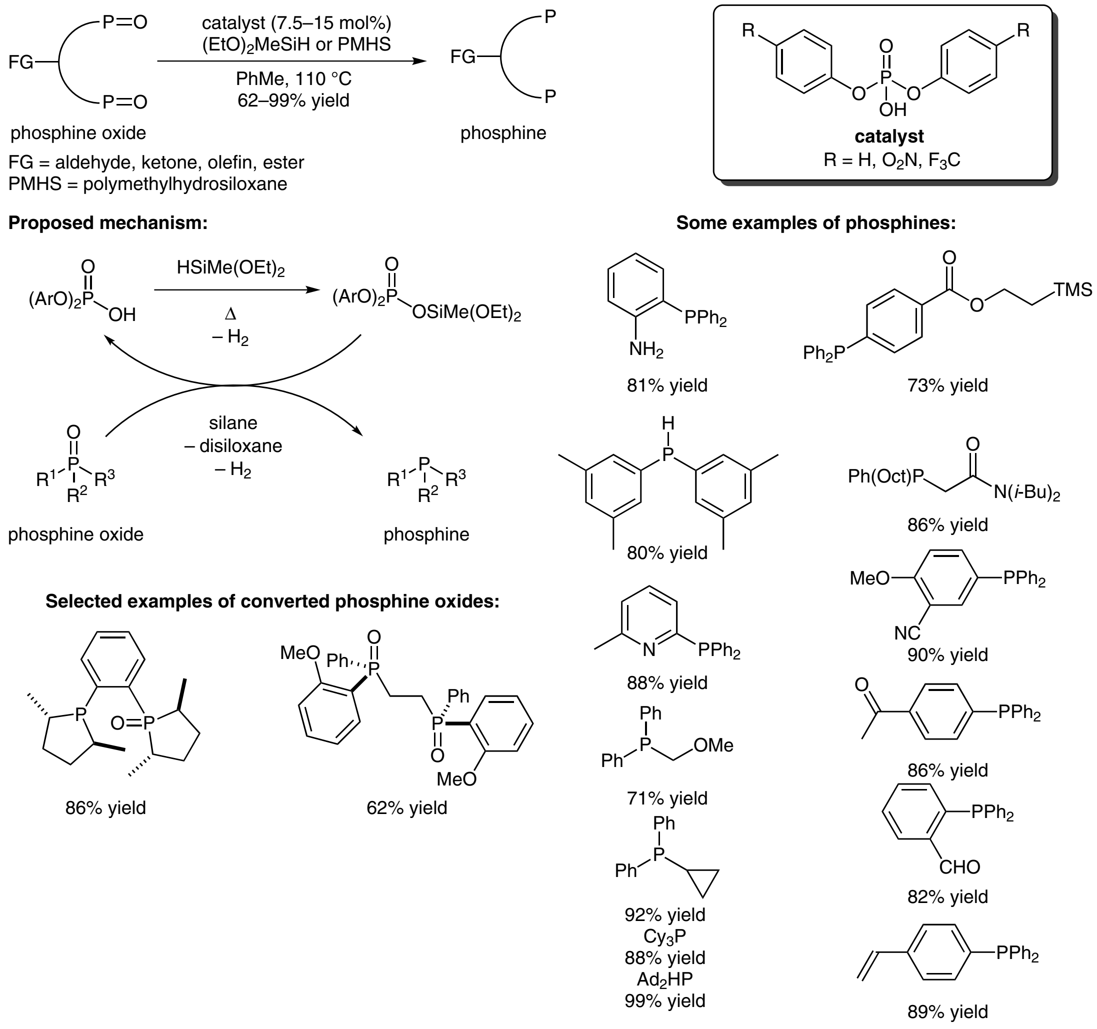
Organocatalytic Chemoselective Reduction of Phosphine Oxides to Phosphines



Significance: Organophosphines represent valuable intermediates, catalysts, and ligands for transition-metal catalysis. Here, the authors report the utilization of inexpensive silanes by Brønsted acid catalysis, which shows broad functional group tolerance towards aldehydes, ketones, olefins, nitriles, and esters. Chemoselectivities of 99:1 for P–O double bonds and retention of the configuration at the P-center were achieved.

Comment: The catalytic chemoselective reduction of P–O double bonds (502 kJ/mol) is a formidable challenge in synthetic chemistry. This metal-free protocol under convenient, air-insensitive, and safe reaction conditions for aryl, alkyl, mono- and bidentate phosphine oxides with its high functional group tolerance indicates possible applications in catalytic Wittig, Appel, and Staudinger reactions.

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Category

Organo- and Biocatalysis

Key words

silanes

Brønsted acids

phosphine oxide reduction

chemoselective reduction