

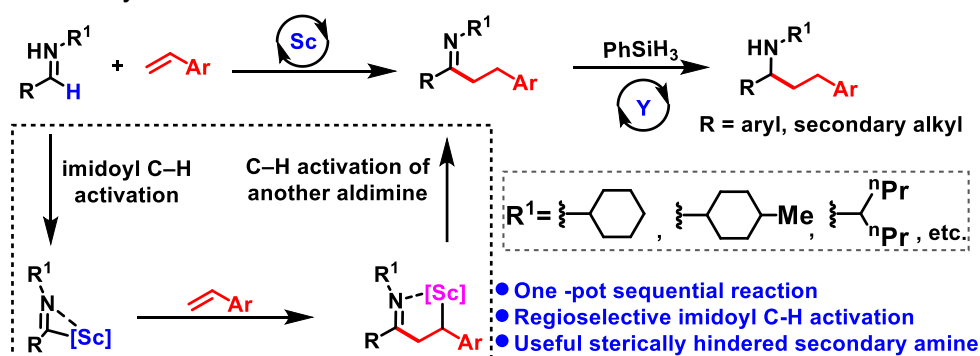
## Rare-Earth-Catalyzed Sequential Imido C-H Alkylation and Hydrosilylation of Aldimines

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Sterically hindered secondary amines are an important class of compounds that constitute the major body of bioactive natural products and pharmaceuticals.<sup>[1]</sup> Therefore, the development of efficient and selective methods for the synthesis of such bulky secondary amines is of great interest and much importance. In principle, the imido C-H alkylation of readily available aldimines with alkenes, which involves the insertion of an alkene into the imido C-H bond, would constitute a straightforward and atom-efficient way for the synthesis of bulky ketimines which after reduction can convert to corresponding secondary amines.<sup>[2]</sup> However, the related reports of such reactions are limited to specially designed functional group to facilitate chelation-assisted imido C-H activation.<sup>[3]</sup> Here we report for the first time sequential imido C-H alkylation of aldimines with alkenes followed by hydrosilylation of ketimines catalyzed by half-sandwich rare-earth catalysts.

This protocol offers a straightforward and step-economical route for the synthesis a series of sterically hindered secondary amines from easily accessible aldimines, alkenes and silanes. The imido C-H alkylation of aldimines with styrenes selectively gave the corresponding ketimines by a scandium catalyst and then successive yttrium-catalyzed hydrosilylation can convert to sterically hindered secondary amines, featuring good yields, broad substrate scope, high chemo- and regioselectivity and simple reaction conditions. The reaction mechanism for the imido C-H alkylation was clarified by DFT calculation.



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