

Photocatalytic Generation of *N*-Centered Sulfamidyl Radical for Selective Functionalization of Si-H/Ge-H Bond

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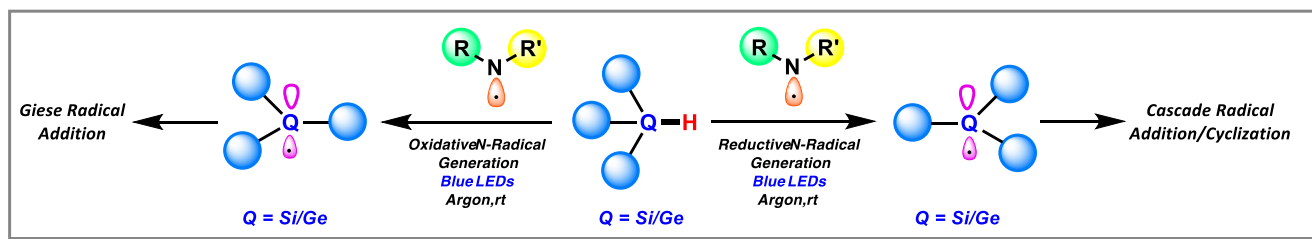
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Abstract:

Organosilanes are versatile intermediates in organic synthesis, and they have prevailing applications in material science, agrochemicals, polymer science, and the pharmaceutical industry.^{1a-b} Due to the high lipophilic nature of silicon, organosilanes, and silyl analogs of bioactive compounds have appreciable physiochemical properties which makes them an ideal candidate for drug discovery.^{1c-e} To access organosilane, hydrosilylation of alkenes *via* direct activation of Si-H bond in hydrosilanes is vastly significant because of the high atom economy of the approach.^{1f}



In the past two decades, visible light photoredox catalysis has made a significant impact in the field of synthetic organic chemistry. In addition to single electron transfer (SET) and energy transfer process, hydrogen atom transfer is more frequently encountered in photoredox catalysis. Recent reports on selective Si-H bond functionalization of hydrosilanes under photolytic conditions suffered from poor site-selectivity² likely due to the similar BDEs (Si-H vs C-H)³.

In this presentation, the synthetic utility of newly designed hydrogen atom transfer catalyst/reagents induced *N*-centered radical assisted selective functionalization of Si-H/Ge-H bond (from hydrosilanes and hydrogermanes) for the hydro(silylation) and hydro(Germylation) followed by the Giese radical addition⁴ as well as cascade radical addition/cyclization⁵, under visible light-mediated metal free condition will be discussed.

References:

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