Synthetic, structural and reaction chemistry of novel silylene compounds

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Silylene compounds, R_2Si, have attracted significant attention ever since their implication in the formation of West's landmark disilene Mes_4Si_2 in 1981.[1] In more recent reports, increasing structural diversity has become apparent in isolable examples of these heavier congeners of carbenes. This in turn has allowed for wide-ranging exploration of their reactivity, not least in respect of small molecule activation.

We have recently been interested in developing routes to novel silylene systems (and their germanium and tin analogues),[2-5] both cyclic and acyclic, and either base-stabilized or two-coordinate. The chemistry of such systems – both towards small molecule substrates (e.g. H_2, NH_3, CO, alkynes) and as potential precursors to analogues of classical organic carbonyl compounds via oxidation/substitution routes have been probed.

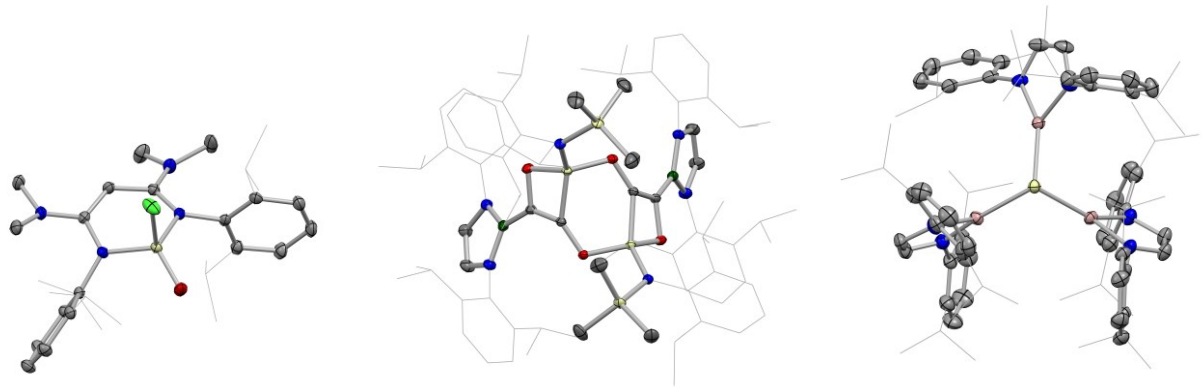

Figure 1. Examples of silicon systems obtained via reactions of silylenes in our labs.

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