

Structure and Properties of Silylene-Coordinated Si=B Bonded Species

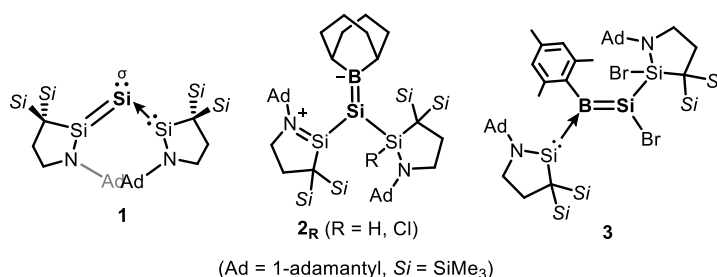
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Heavier multiply bonded species of p-block elements have attracted interest not only due to their unique optical properties attributed to the narrow HOMO-LUMO gap, but due to their ability to activate small molecules such as H₂ and CO.¹ While the structures and reactivities of homoatomic doubly bonded species of silicon (disilenes) and boron (diborenes) have been extensively investigated, the studies on their heteroatomic counterpart, Si=B double-bonded species, remain scarce.²

Recently, our group reported the synthesis of the cyclic (alkyl)(amino)silylene (CAASi)-stabilized monoatomic silicon complex **1** which exhibits a π -delocalized-ylidene structure in solution (Chart 1).³ Spectroscopic studies and DFT calculations revealed the high electron density on the central silicon atom as well as the highly polarized Si=Si double bond character of silylone **1** which brought us to think that **1** could be an adequate precursor to access new silicon-containing π -electron systems. Herein, we report the facile synthesis of CAASi-stabilized zwitterionic boratasilenes **2_R** and borasilene **3** (Chart 1) by the treatment of **1** towards various hydro/haloboranes at ambient conditions. In this presentation, the synthesis, structure, and unique electronic properties of the Si=B bonded species will be discussed.

Chart 1.



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