1,1- and 1,2-Allylboration of Alkyn-1-ylsilanes Bearing Si-H Functions. Electron-Deficient Si-H-B Bridges, and Intramolecular Hydrosilylation

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The reactions of \( n \)-hexyn-1-ylsilanes or arylethyn-1-ylsilanes, bearing methyl groups and one (2), two (3) or three hydride functions (4) at the silicon atom, with triallylborane 1 lead primarily to products of 1,1- or 1,2-allylboration. In the alkenes (5, 9, 13) formed by stereoselective 1,1-allylboration, with the silyl and the diallylboryl groups in cis-positions at the C=C bond an electron-deficient Si-H-B bridge is present. The activation of the Si-H bond in these alkenes induces intramolecular hydrosilylation under very mild reaction conditions to give 1,4-silabora-cyclohept-2-enes (7 and 11). The products of 1,2-allylboration (6, 10, 14) are further transformed into 1-boracyclohex-2-enes (8, 12, 15) and 7-borabicyclo[3.3.1]non-2-enes (16, 17) by intramolecular 1,2-allylboration reactions. The proposed structures are based on consistent sets of \(^1\text{H}, \ 11\text{B}, \ 13\text{C} \) and \(^{29}\text{Si} \) NMR data.

Key words: Silanes, Alkynes, Triallylborane, Organoboration, Heterocycles, NMR