Amido-Substituted, Unsaturated Silicon Clusters

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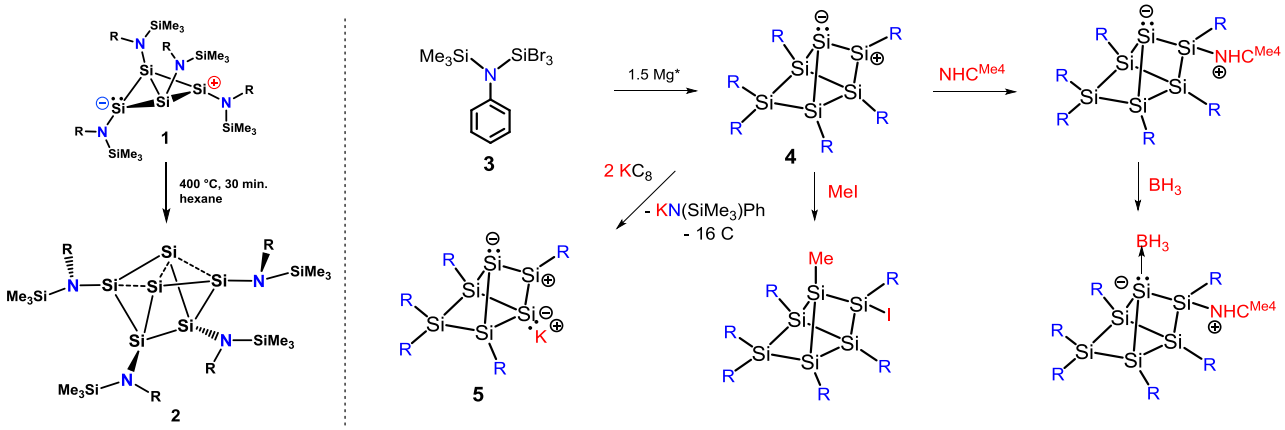
Unsaturated silicon clusters with unsubstituted silicon atoms - named as siliconoids - stimulate research due to their unusual bonding situations and peculiar electronic situations.[1] The configuration of the ligand-free silicon atoms was discussed as inverted tetrahedral[2] and hemispheroidal.[3] The latter classification resulted in the introduction of the hemispheroidality parameter.[4] Furthermore, anionic derivatives of siliconoids can be easily functionalized with different groups such as boryl, silyl and phosphanyl.[5]

My group found access to two different amido-substituted siliconoid clusters. Cluster **2** was obtained by thermolysis of the bicyclic silicon(I) ring compound **1**[6] and represents the silicon version of a butalene.[7] In solution, two isomers of **2** are present in a 2:1 ration due to either different orientation of the amido substituents or due to a molecular dynamics in the Si_6 cluster core. The second cluster **4** was obtained from the tribromosilane **3** by reductive debromination with activated magnesium. Cluster **4** represents an unusual isomer of hexasilabenzene and includes a highly twisted Si=Si bond with a pyramidal and a trigonal planar Si atom.[8] This gives **4** zwitterionic character that can be exploited in reactions with Lewis acids and bases, methyliodide and iodine.[8] Cluster **4** can be transformed into an anionic derivative upon cleavage of one amido substitutent with KC_8. The electronic structure and the reactivity of the resulting cluster $[Si_6\{N(SiMe_3)Ph\}_5]^-$ **5** will be presented and discussed.



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