Synthesis and Functionalization of Silyl-Substituted Disilenes via Selective Cleavage of Si–Si bond

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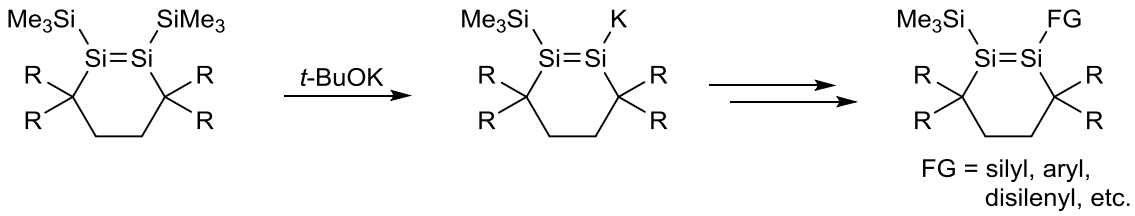
Over the past three decades, various types of stable compounds that contain Si=Si double bonds (disilenes) have been synthesized as prospects for advanced π-electron systems due to substantially high HOMO energy level and narrow HOMO-LUMO gap compared to those of the corresponding organic π electron systems.[1] In this context, the extension of π-electron systems represents a promising strategy for the development of novel π-electron compounds of silicon with new electronic and optical properties. Disilenides (disilicon analogues of vinyl anions ($R_2Si{=}SiR^-$) are one of the promising reagents to extend the silicon π electron systems.[2] However, disilenides have been synthesized under strongly reducing conditions which may not be suitable for the synthesis of the extended π electron systems of silicon. Very recently, we found a novel route to a disilenide from a stable disilenes under milder conditions. In this route, a disilenide is generated from the reaction of a trimethylsilyl-substituted disilene and potassium *t*-butoxide via selective cleavage of the Si(sp^2)–Si(sp^3) bond on the Si=Si double bond.[3] In this presentation, we would like to focus on stable compounds that contain Si=Si double bonds derived from stable silyl-substituted disilenes.



[1] Recent Reviews: (a) V. Ya. Lee, A. Sekiguchi, in *Organometallic Compounds of Low-Coordinate Si, Ge, Sn and Pb: From Phantom Species to Stable Compounds*; Wiley-VCH: Chichester, Germany, 2010; pp. 199–334. (b) T. Iwamoto, S. Ishida, *Struct. Bonding*, **2014**, *156*, 125-202.

[2] Recent Reviews: (a) C. Präsang, D. Scheschkewitz, *Chem. Soc. Rev.* **2016**, *45*, 900–921. (b) A. Rammo, D. Scheschkewitz, *Chem. Eur. J.* (DOI: 10.1002/chem.201704090).

[3] N. Akasaka, K. Fujieda, E. Garoni, K. Kamada, H. Matsui, M. Nakano, T. Iwamoto, *Organometallics* **2018**, *37*, 172-175. (b) N. Akasaka, K. Tanaka, S. Ishida, T. Iwamoto, *Inorganics* **2018**, *6*, 21.