

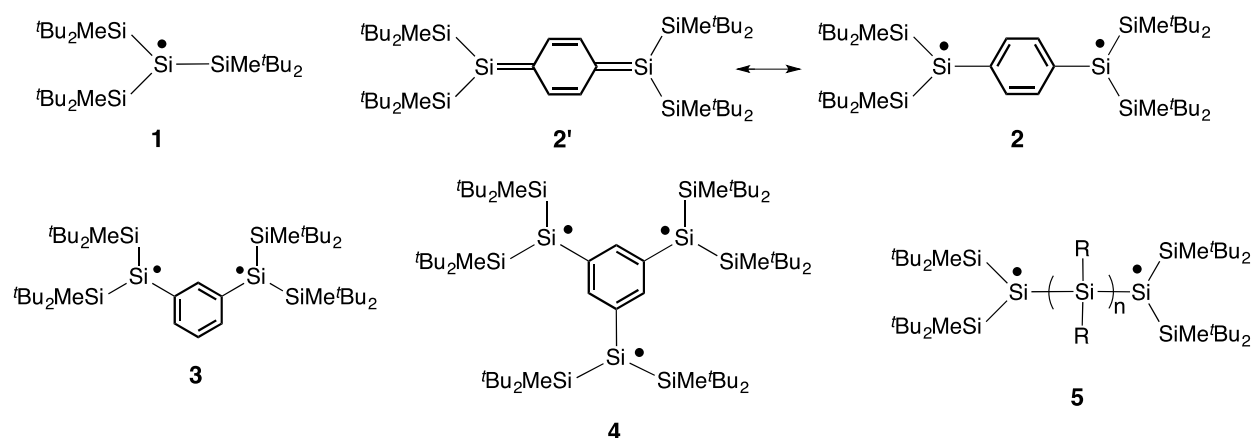
Stable silyl radicals: From phantom species to isolable compounds and their application

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Open-shell compounds are among the most fundamental reactive intermediates in the group 14 element chemistry. Until recently considered to be only fleeting species, silyl, germyl and stannyl radicals now constitute an important class of isolable and characterizable compounds. We reported several silyl radicals: for example, a cyclotetrasilanyl radical, a silyl radical lacking stabilization by π -conjugation, a disilene anion radical, a disilyne anion radical, silylene anion and cation radicals, and alkali-metal-substituted silyl radicals.^[1] Here, the chemistry of the acyclic silyl radical **1**, bis(silyl)radicals **2** and **3** bridged by benzene ring, tris(silyl)radical **4**, and bis(silylradicals) **5** bridged by Si–Si σ -bonds will be presented, as well as the general trends affecting the stability, geometry and electronic state of these radicals. As one of the most important developments, the potential application of stable radicals in the design of new advanced materials (energy storage systems such as batteries, etc.) will be presented.^[2]



- [1] Review: V. Ya. Lee, A. Sekiguchi, *Organometallic Compounds of Low-Coordinate Si, Ge, Sn and Pb: From Phantom Species to Stable Compounds*, Wiley, Chichester, 2010, Chapter 2.
- [2] (a) H. Maruyama, H. Nakano, M. Nakamoto, A. Sekiguchi, *Angew. Chem., Int. Ed.* **2014**, 53, 1324-1328. (b) Y. Imada, H. Nakano, K. Furukawa, R. Kishi, M. Nakano, H. Maruyama, M. Nakamoto, A. Sekiguchi, M. Ogawa, T. Ohta, Y. Yamamoto, *J. Am. Chem. Soc.* **2016**, 138, 479-482.