

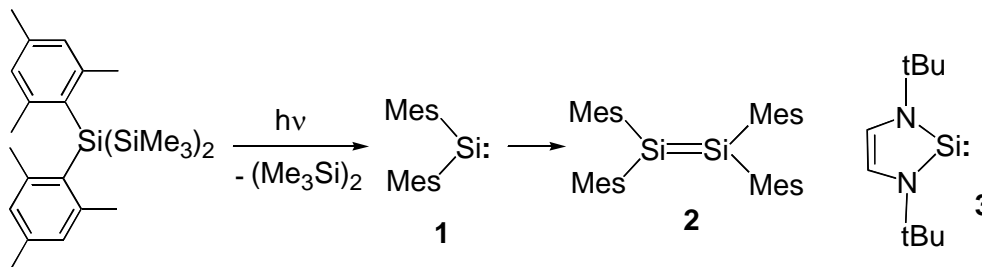
THE DISCOVERY OF STABLE DISILENES AND SILYLENES

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Twenty years ago, at the 15th Organosilicon Symposium, stable compounds containing Si=C and Si=Si bonds were first reported.^{1,2} Together with the nearly simultaneous discovery of P=P double bonds by Yoshifuji,³ this led to the overturning of the classical “double bond rule”, and to an entire area of research embodying many kinds of multiple bonds to heavier elements.

The discovery of stable disilenes arose from matrix-isolation studies of photochemically generated, highly reactive silylenes, R₂Si: Eventually we prepared the hindered silylene, dimesitylsilylene (**1**). When the matrix containing this species was warmed, the stable molecule tetramesityldisilene (**2**) was obtained. Extensive studies have shown that the Si=Si chemical bond in disilenes is similar electronically to the C=C double bond in alkenes.



More recently, stable silylenes have also been prepared. The first example was the silylene **3**, which is stabilized by electron donation from nitrogen as well as by aromatic electron delocalization.⁴ Silylene **3** survives heating up to 220 °C.

1. A. G. Brook, Abstracts of the XVth Organosilicon Symposium, Durham, NC, March 27-28, 1981
2. R. West, M. J. Fink, J. Michl, Abstracts of the XVth Organosilicon Symposium, Durham, NC, March 27-28, 1981
3. M. Yoshifuji, J. Am. Chem. Soc., 103, 4587 (1981).
4. M. Denk, R. K. Hayashi, R. West, Chem. Commun., 33 (1994).