

Metal-Silicon Triple Bonds

Alexander C. Filippou*, Priyabrata Ghana, Ujjal Das, David Hoffmann

Institute of Inorganic Chemistry, University of Bonn, 53121 Bonn, Germany, E-Mail: filippou@uni-bonn.de

Silylidyne complexes are a unique class of compounds in silicon chemistry featuring a triple bond between a linearly coordinated silicon atom and a transition metal center (Figure 1).^[1] As silicon congeners of alkylidyne complexes these compounds bear a large synthetic potential in both transition-metal and silicon chemistry originating from the highly reactive, diversely functionalizable $M\equiv Si-R$ bond ($M = d$ -block metal), which has been exploited successfully to some extent in recent years.^[2,3] Isolation of these compounds is very challenging and requires a fine stereoelectronic tuning of the metal center and steric protection of the highly electrophilic silicon atom to circumvent undesired follow-up reactions, such as a head-to-tail cyclooligomerisation, destroying the $M\equiv Si-R$ functional group.^[4,5]

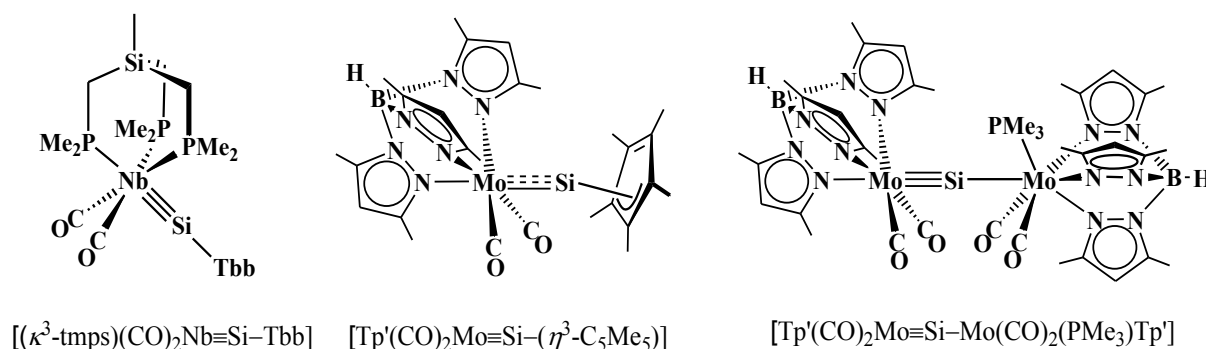


Figure 1. Selected novel silylidyne complexes.

In the present work recent approaches to novel silylidyne complexes of Group 4, 5, 6 and 10 metals will be presented taking advantage of stereoelectronically fine tuned coordination spheres, and the reactivity of the silylidyne complexes will be illustrated on selected examples (Figure 1).

- [1] A. C. Filippou, O. Chernov, K. W. Stumpf, G. Schnakenburg, *Angew. Chem. Int. Ed.* **2010**, *49*, 3296-3300.
- [2] A. C. Filippou, O. Chernov, G. Schnakenburg, *Angew. Chem. Int. Ed.* **2011**, *50*, 1122-1126.
- [3] A. C. Filippou, B. Baars, O. Chernov, Y. N. Lebedev, G. Schnakenburg, *Angew. Chem. Int. Ed.* **2014**, *53*, 565-570.
- [4] A. C. Filippou, D. Hoffmann, G. Schnakenburg, *Chem. Sci.* **2017**, *8*, 6290-6299.
- [5] P. Ghana, M. I. Arz, G. Schnakenburg, M. Straßmann, A. C. Filippou, *Organometallics* **2018**, *37*, DOI: 10.1021/acs.organomet.7b00665.