

Snapshots of key steps on Si-H bond activation with NHC-stabilized nickel(0)-complexes

Zell, T., Schaub, T., Trumpp, A., Radacki, K., Radius*, U.

Prof. Dr. Udo Radius, Julius-Maximilians-Universität, Institut für Anorganische Chemie, Am Hubland, 97074 Würzburg, Germany.

We are exploring the chemistry of the nickel complex $[\text{Ni}_2(\text{Pr}_2\text{Im})_4(\text{COD})]$ **1** ($\text{Pr}_2\text{Im} = 1,3\text{-di-}i\text{-isopropyl-imidazol-2-ylidene}$) in some detail and have recently shown that this complex acts as an excellent source for the very electron rich nickel(0) biscarbene complex fragment $\{\text{Ni}(\text{Pr}_2\text{Im})_2\}$.^[1, 2]

The metal-mediated catalytic transformation of organosilanes is a powerful tool in organosilane chemistry. Whereas reactions of hydrosilanes with complexes of Pt, Pd, Rh or Ir are well investigated,^[3] studies using nickel-complexes are scarce. In this contribution the first examples of isolated and well characterized silyl hydride complexes of nickel, *cis*- $[\text{Ni}(\text{Pr}_2\text{Im})_2(\text{SiMePh}_2)(\text{H})]$ **2** (see Figure 1) and *cis*- $[\text{Ni}(\text{Pr}_2\text{Im})_2(\text{SiPh}_3)(\text{H})]$ **3** are presented. These compounds have been prepared from the reaction of the corresponding hydrosilanes with $[\text{Ni}_2(\text{Pr}_2\text{Im})_4(\text{COD})]$ **1**. We report details on the characterization of these complexes and similar compounds as well as first results on investigations of their reactivity.

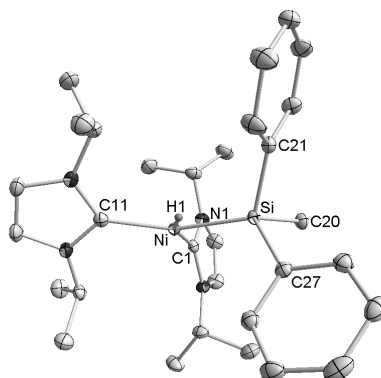


Figure 1: ORTEP-50 diagram of the molecular structure of **2** in the solid state.

[1] (a) U. Radius, F. M. Bickelhaupt, *Organometallics* **2008**, 27, 3410. (b) U. Radius, F. M. Bickelhaupt, *Coord. Chem. Rev.* **2009**, 253, 678.

[2] (a) T. Schaub, U. Radius, *Chem. Eur. J.* **2005**, 11, 5024-5030. (b) T. Schaub, M. Backes, U. Radius, *Organometallics* **2006**, 25, 4196-4206. (c) T. Schaub, M. Backes, U. Radius, *J. Am. Chem. Soc.* **2006**, 128, 15964-15965. (d) T. Schaub, C. Döring, U. Radius, *Dalton Trans.* **2007**, 1993-2002. (e) T. Schaub, M. Backes, U. Radius, *Chem. Commun.* **2007**, 2037-2039. (f) T. Schaub, P. Fischer, A. Steffen, T. Braun, U. Radius, A. Mix, *J. Am. Chem. Soc.* **2008**, 130, 9304-9317. (g) T. Schaub, M. Backes, O. Plietzsch, U. Radius, *Dalton Trans.* **2009**, 7071-7079.

[3] for general reviews see e.g. (a) J. Y. Corey, J. Braddock-Wilking, *Chem. Rev.* **1999**, 99, 175-292. (b) Z. Lin, *Chem. Soc. Rev.* **2002**, 31, 239-245. (c) R. Perutz, S. Sabo-Etienne, *Angew. Chem.* **2007**, 119, 2630-2645, *Angew. Chem. Int. Ed.* **2007**, 46, 2578-2592.