



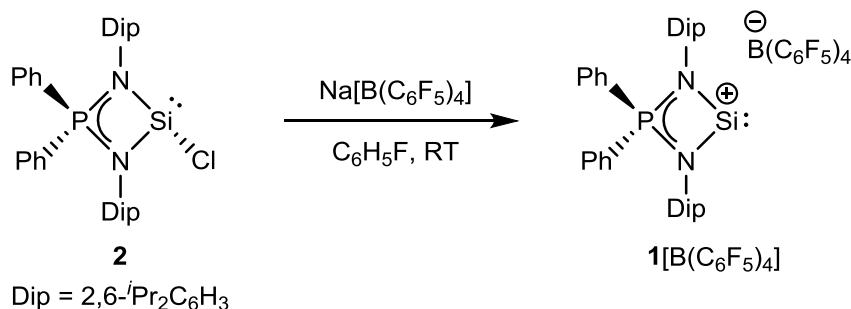
Iminophosphonamido-Supported Silyliumylidene: Synthesis and Properties

Norio Nakata,^[a] Kazuki Nakaya,^[a] Yugo Kazama,^[a] and Akihiko Ishii^[a]

^[a] Department of Chemistry, Graduate School of Science and Engineering, Saitama University, Shimo-okubo, Sakura-ku, Saitama 338-8570, Japan

Silyliumylidenes ($[\text{RSi:}]^+$) have attracted considerable attention due to their unique structures and properties. These species possess a lone pair of electrons and two vacant p-orbitals on the monovalent silicon(II) center, which endows them with high Lewis-acidic properties and the amphiphilic character typical of silylenes. While a number of three-coordinated silyliumylidenes have been reported in recent decades, research on the two-coordinated derivatives has remained limited.

In our recent work, we have focused on synthesizing strong σ -donating tetrylenes.¹⁻⁴ For example, iminophosphonamido-supported chlorosilylenes $[\text{Ph}_2\text{P}(\text{NR})_2\text{SiCl}]$ exhibit unprecedented coordination behavior toward transition-metal fragments and unique reactivity with nucleophiles due to their strong σ -donating properties. Here, we present the synthesis and properties of a two-coordinated silyliumylidene of the type $[\text{Ph}_2\text{P}(\text{NDip})_2\text{Si:}][\text{B}(\text{C}_6\text{F}_5)_4]$ ($\mathbf{1}[\text{B}(\text{C}_6\text{F}_5)_4]$, Dip = 2,6-*i*-Pr₂C₆H₃), wherein the silicon(II) center is stabilized by an iminophosphonamide ligand. We also describe unique reactivities of $\mathbf{1}[\text{B}(\text{C}_6\text{F}_5)_4]$ such as H₂ activation, cycloaddition, and coordination chemistry toward Group 10 metal complexes.



References

1. S. Takahashi, J. Sekiguchi, A. Ishii, N. Nakata, *Angew. Chem. Int. Ed.* 2021, **60**, 4055–4059.
2. S. Takahashi, A. Ishii, N. Nakata, *Chem. Commun.* 2021, **57**, 3203–3206.
3. S. Takahashi, A. Ishii, N. Nakata, *Chem. Commun.* 2021, **57**, 6728–6731.
4. S. Takahashi, J. Sekiguchi, K. Nakaya, A. Ishii, N. Nakata, *Inorg. Chem.* 2022, **61**, 7266–7273.