

The Laboratory for Organic and Inorganic Chemistry

Seminar

Monday, May 29th at 11:30 in the Seminar Room

Prof. Matthias Tamm

Technische Universität Braunschweig

On the Topic of:

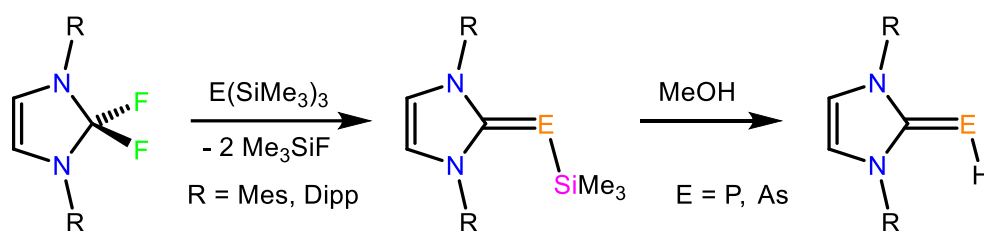
**N-Heterocyclic Carbene-Pnictogen Adducts and
Their Use as Ligands in Transition Metal Chemistry**

N-Heterocyclic Carbene-Pnictogen Adducts and Their Use as Ligands in Transition Metal Chemistry

Matthias TAMM

Institut für Anorganische und Analytische Chemie, Technische Universität Braunschweig,
Germany; m.tamm@tu-bs.de, <https://www.tu-braunschweig.de/iaac>

Soon after the advent of stable N-heterocyclic carbenes (NHC),¹ pnictinidene adducts such as (NHC)ER (E = P, As; R = Ph, CF₃, C₆F₅) were among the first carbene complexes of p-block elements to be prepared directly from free carbenes and suitable main-group compounds.² Our group has contributed to this field by preparation of NHC-supported phosphinidenes and arsinidenes (NHC)ER (E = P, As; R = SiMe₃, H) through reaction of 2,2-difluoroimidazolines (NHC)F₂ (NHC = IDipp, IMes) with E(SiMe₃)₃ (E = P, As; Scheme 1).^{3,4} These complexes were used for the preparation of transition metal complexes of the type [(NHC)EML_n]^{3,5-7} and for the preparation of heteroleptic dicarbene-dielement species of the type[(NHC)EE'(NHC)] (E, E' = P, As).⁸⁻¹⁰ Along these lines, recent applications of the novel (NHC)E-transfer reagents in transition metal and main-group element chemistry and potential applications in homogeneous catalysis will be discussed.^{11,12}



References

- 1 Arduengo III, A. J.; Harlow, R.; Kline, M. *J. Am. Chem. Soc.* **1991**, *113*, 361–363.
- 2 Arduengo III, A. J.; Calabrese, J. C.; Cowley, A. H.; Dias, H. V. R.; Goerlich, J. R.; Marshall, W. J.; Riegel, B. *Inorg. Chem.* **1997**, *36*, 2151–2158.
- 3 Doddi, A.; Bockfeld, D.; Bannenberg, T.; Jones, P. G.; Tamm, M. *Angew. Chem. Int. Ed.* **2014**, *53*, 13568–13572.
- 4 Doddi, A.; Weinhart, M.; Hinz, A.; Bockfeld, D.; Goicoechea, J. M.; Scheer, M.; Tamm, M. *Chem. Commun.* **2017**, *53*, 6069–6072.
- 5 Peters, M.; Doddi, A.; Bannenberg, T.; Freytag, M.; Jones, P. G.; Tamm, M. *Inorg. Chem.* **2017**, *56*, 10785–10793.
- 6 Doddi, A.; Bockfeld, D.; Bannenberg, T.; Tamm, M. *Chem. Eur. J.* **2020**, *26*, 14878–14887.
- 7 Doddi, A.; Bannenberg, T.; Bockfeld, D.; Tamm, M. *Z. Anorg. Allg. Chem.* **2023**, e202300025.
- 8 Doddi, A.; Bockfeld, D.; Zaretske, M. K.; Kleeberg, C.; Bannenberg, T.; Tamm, M. *Dalton Trans.* **2017**, *46*, 15859–15864.
- 9 Doddi, A.; Bockfeld, D.; Zaretske, M. K.; Bannenberg, T.; Tamm, M. *Chem. Eur. J.* **2019**, *25*, 13119–13123.
- 10 Ho, L. P.; Zaretske, M. K.; Bannenberg, T.; Tamm, M. *Chem. Commun.* **2019**, *55*, 10709–10712.
- 11 Bhattacharjee, J.; Bockfeld, D.; Tamm, M. *J. Org. Chem.* **2022**, *87*, 1098–1109.
- 12 For a general review on "N-Heterocyclic Carbene Adducts of Main Group Elements and Their Use as Ligands in Transition Metal Chemistry" see: Doddi, A.; Peters, M.; Tamm, M. *Chem. Rev.* **2019**, *119*, 6994–7112.

