

Advanced design of backbone- and laterally-functionalized N-Heterocyclic Carbenes

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Abstract

N-heterocyclic carbenes (NHCs) play a pivotal role in modern chemistry and are continuously finding new and exciting applications across the chemical sciences.^[1] In this lecture, we show our recent progresses towards the direct functionalization of the carbenic heterocycle (backbone-functionalization) and the “lateral”-functionalization of the rigid bicyclic carbenic scaffold derived from imidazo[1,5-a]pyridine. These two complementary strategies enable – *inter alia* – the drastic modulation of the electronic properties, the access to highly efficient NHC catalysts for organometallic (enantioselective) catalysis, and to luminescent, redox-active or ambidentate bridging NHC ligands.^[2]

References:

[1] P. Bellotti, M. Koy, M. N. Hopkinson, F. Glorius, *Nat. Rev. Chem.* **2021**, *5*, 711-725.

[2] Recent references: (a) L. Pallova, L. Abella, M. Jean, N. Vanthuyne, C. Barthes, L. Vendier, J. Autschbach, J. Crassous, S. Bastin, V. César, *Chem. Eur. J.* **2022**, *28*, e202200166. (b) A. A. Grineva, O. A. Filippov, Y. Canac, J.-B. Sortais, S. E. Nefedov, N. Lugan, V. César, D. A. Valyaev, *Inorg. Chem.* **2021**, *60*, 4015-4025. (c) I. Benaïssa, K. Gajda, L. Vendier, N. Lugan, A. Kajetanowicz, K. Grela, V. Michelet, V. César, S. Bastin, *Organometallics* **2021**, *40*, 3223-3234. (d) A. Bonfiglio, L. Pallova, V. César, C. Gourlaouen, S. Bellemin-Lapponnaz, C. Daniel, F. Polo, M. Mauro, *Chem. Eur. J.* **2020**, *26*, 11751-11766. (e) Y. Tang, I. Benaïssa, M. Huynh, L. Vendier, N. Lugan, S. Bastin, P. Belmont, V. César, V. Michelet, *Angew. Chem. Int. Ed.* **2019**, *58*, 7977-7981. (f) A. A. Grineva, O. A. Filippov, S. E. Nefedov, N. Lugan, V. César, D. A. Valyaev, *Organometallics* **2019**, *38*, 2330-2337. (g) M. Ruamps, S. Bastin, L. Rechinat, A. Sournia-Saquet, D. A. Valyaev, J.-M. Mousca, N. Lugan, V. Maurel, V. Cesar, *Chem. Commun.* **2018**, *54*, 7653-7656.

Vincent CÉSAR



Dr. Vincent César (born 1977) is currently Directeur de Recherche CNRS at the Laboratoire de Chimie de Coordination (LCC-CNRS, UPR8241), in Toulouse (France). He was educated at the “Ecole Normale Supérieure de Lyon” (France), where he obtained an “Agrégation” in Physical Sciences (major in chemistry) in 2000. He completed his thesis in 2004 under the supervision of Prof. L. H. Gade and Dr. S. Bellemin-Lapponnaz at the “Université Louis Pasteur” in Strasbourg working on chiral oxazolonyl/N-heterocyclic carbene ligands. He then joined Prof. A. Fürstner at the Max Planck Institut für Kohlenforschung in Mülheim/Ruhr (Germany) as an Alexander-von-Humboldt fellow. In 2006, he was appointed CNRS researcher at the “Laboratoire de Chimie de Coordination du CNRS” in Toulouse. His research interests are focused on the design and development of new N-Heterocyclic Carbenes for organometallic chemistry and catalysis.