

Prof. Martin Albrecht

Department für Chemie und Biochemie,
Universität Bern,
Freiestrasse 3, CH-3012 Bern, CH
martin.albrecht@dcb.unibe.ch

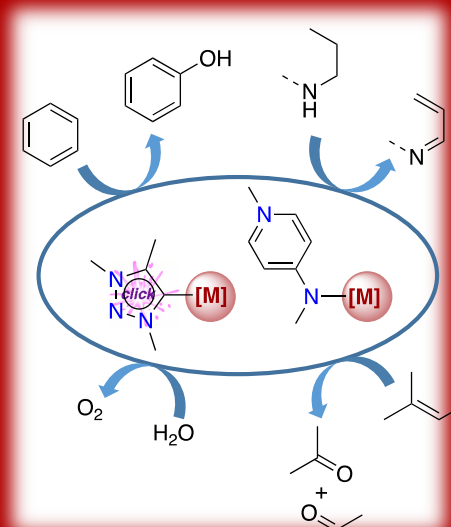
Homogeneous Oxidation Catalysis with Designer Ligands

Venerdì 28 Maggio 2021, ore 15.00

<https://unipd.zoom.us/j/763282419>

Homogeneous catalysis has long been focusing on reduction and substitution reactions such as hydrogenation, cross coupling, Ziegler-Natta polymerization, or olefin metathesis. This focus has been a key trigger for the evolution of new and powerful ligands, especially amines, phosphines, aromatics and related systems. These ligands are generally incompatible with the oxidative conditions that are inherent to tackle pressing energy-relevant transformations such as CO₂ transformation, water oxidation as key step of artificial photosynthesis, or for oxidative C–H functionalization. Hence, new ligands are required that withstand these harsher conditions.

To address this need, we have developed different ligand scaffolds, in particular triazolylidenes as powerful and synthetically versatile subclass of N-heterocyclic carbenes, and PYAs, sometimes referred to as N-heterocyclic imines, which are remarkably robust under highly oxidative conditions, and which impart high catalytic activity to coordinated metal centers. Here, we will briefly discuss general features of these new ligands and demonstrate with case studies their application in oxidation catalysis for transformations relevant to organic synthesis (olefin oxidation, benzene oxidation) as well as energy-relevant processes (water oxidation, hydrogen storage, CO₂ electroreduction).



For selected references, see:

- 1 P. Maitew, A. Neels, M. Albrecht, *J. Am. Chem. Soc.* **2008**, *130*, 13534.
- 2 A. Vivancos, C. Segarra, M. Albrecht, *Chem. Rev.* **2018**, *118*, 9493.
- 3 R. Lalrempuia et al., *Angew. Chem. Int. Ed.* **2010**, *49*, 9765.
- 4 L. Bernet et al., *Chem. Commun.* **2011**, *47*, 8058.
- 5 I. Corbucci et al., *ACS Catal.* **2015**, *5*, 2714.
- 6 M. Navarro et al., *Chem. Eur. J.* **2016**, *21*, 6740.
- 7 A. Vivancos, M. Beller, M. Albrecht, *ACS Catal.* **2018**, *8*, 74.
- 8 K. Salzmann, C. Segarra, M. Albrecht, *Angew. Chem. Int. Ed.* **2020**, *59*, 8932.
- 9 A. Weilhardt et al., *J. Catal.* **2020**, *385*, 1.
- 10 S. Bertini, et al., *Green Chem.*, **2021** DOI: 10.1039/D1GC00388G.

La presenza della S. V. sarà molto gradita.

Prof. Michele Maggini
Direttore del Dipartimento
di Scienze Chimiche



UNIVERSITÀ
DEGLI STUDI
DI PADOVA

Corso di Dottorato
in Scienze Molecolari



Dipartimento di
Scienze Chimiche