

Designing new Ligands: Catalytic Applications of Pyridine-Containing Macrocyclic Complexes

Alessandro Caselli and Giorgio Tseberlidis

Department of Chemistry, Università degli Studi di Milano and ISTM-CNR-Milano, Via Golgi 19, 20133 Milan, Italy. E-mail: alessandro.caselli@unimi.it

The introduction of a pyridine moiety into the skeleton of a polyazamacrocyclic ligand affects both the thermodynamic properties and the coordination kinetics of the resulting metal complexes. These features have engendered a great interest in the scientific community and the applications of pyridine-containing macrocyclic ligands range from biology to supramolecular chemistry, encompassing MRI, molecular recognitions, materials and catalysis. In this lecture, I will provide a perspective on the catalytic applications of metal complexes of pyridine-containing macrocyclic ligands (Pc-L's) which have been studied in our group (Figure 1), with a focus interest on the structural features relevant to catalysis.¹ The increased conformational rigidity imposed by the pyridine ring allowed for the isolation and characterization of metal complexes which show a rich coordination chemistry.² The very different conformations accessible upon coordination and the easy tuneable synthesis of the macrocyclic ligands have been exploited in stereoselective syntheses.³

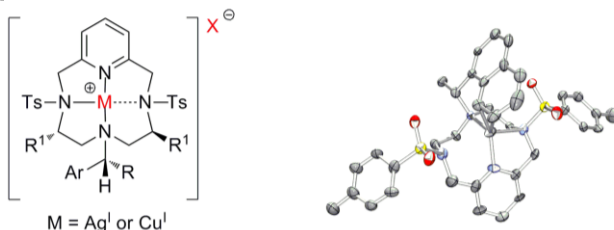


Fig. Metal complexes of Pc-L's and X-ray structure of a Cu(I) complex with a rare η^2 -naphthyl moiety coordinated to the metal center.

Key words: macrocyclic ligands, homogeneous catalysis, copper, silver, C-C bond forming reactions.

References

- ¹ B. Castano, S. Guidone, E. Gallo, F. Ragaini, N. Casati, P. Macchi, M. Sisti, A. Caselli, *Dalton Trans.* **2013**, 42, 2451.
- ² a) G. Tseberlidis, M. Dell'Acqua, D. Valcarengi, E. Gallo, E. Rossi, G. Abbiati, A. Caselli, *RSC Adv.* **2016**, 6, 97404; b) T. Pedrazzini, P. Pirovano, M. Dell'Acqua, F. Ragaini, P. Illiano, P. Macchi, G. Abbiati, A. Caselli, *Eur. J. Inorg. Chem.* **2015**, 2015, 5089.
- ³ a) M. Dell'Acqua, B. Castano, C. Cecchini, T. Pedrazzini, V. Pirovano, E. Rossi, A. Caselli, G. Abbiati, *J. Org. Chem.* **2014**, 79, 3494; b) M. Trose, M. Dell'Acqua, T. Pedrazzini, V. Pirovano, E. Gallo, E. Rossi, A. Caselli, G. Abbiati, *J. Org. Chem.* **2014**, 79, 7311; c) B. Castano, E. Gallo, D. J. Cole-Hamilton, V. Dal Santo, R. Psaro, A. Caselli, *Green Chem.* **2014**, 16, 3202.