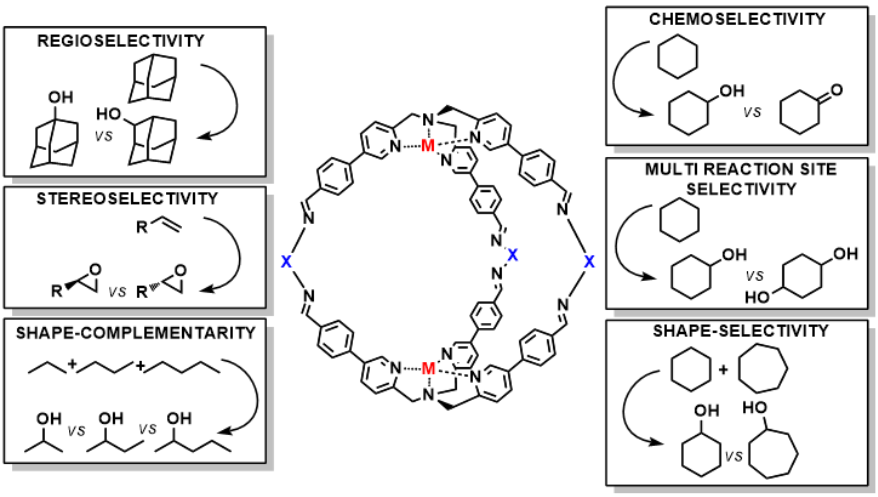
Title	**Supramolecular Catalysis within Confined Systems**
PI	ZONTA Cristiano
Research Group	Molecular Recognition and Catalysis
Curriculum	Scienze Chimiche
Contact	**web:** www.chimica.unipd.it/cristiano.zonta
	email: cristiano.zonta@unipd.it

Project description:



In the last years we have been interested in the application of TPMA metal complexes in catalysis and molecular recognition. TPMA are an important class of chelating ligands in coordination chemistry. These ligands are highly modular tetradentate molecules that effectively coordinate to transition metals, main group elements and lanthanides. Depending on the associated metals, different applications have been reported: catalysis (hydrolysis, oxidation, polymerization,…), molecular recognition, sensing, imaging and oxygen binding. Very recently, PI's group developed a novel supramolecular cage built from the self-assembly of tris(2-pyridylmethyl)amine TPMA zinc complexes through imine condensation chemistry. The research programme will result in the use of these novel system with the final goal to translate molecular confinement into the molecular: In particular the PhD will examine the catalytic properties of cages formed by linking two tris[(2-pyridyl)methyl]amine (TPMA) metal complexes, to take advantage of the properties strictly related to confined spaces and exploiting the presence of active metal sites inside the cavity. This allows to perform catalysis on the basis of: shape (catalysis by confinement), the nature of the metal centres (metal catalysis) and the presence of multiple metal sites (multimetal catalysis). The cages will be tested in oxidation catalysis. Nanocages will display enhanced catalytic properties due to the selectivities typical of homogeneous catalysis such as regio, stereo and chemoselectivity, combined with new selectivities exclusively associated with the confinement of metals in a cavity such as selectivity by shape complementarity and size exclusion. We are expected to find novel selectivties

Publications:

E. Badetti, K. Wurst, G. Licini, C. Zonta *Chem. Eur. J.* **2016**, *22*, 6515. R. Berardozzi, E. Badetti, N.A. Carmo dos Santos, K. Wurst, G. Licini, G. Pescitelli, C. Zonta, L. Di Bari *Chem. Commun.* **2016**, *52*, 8428. F. A. Scaramuzzo, E. Badetti, G. Licini, C. Zonta *Eur. J. Org. Chem.* **2017**, 1438. C. Bravin, E. Badetti, F.A. Scaramuzzo, G. Licini, C. Zonta *J. Am. Chem. Soc.* **2017**, *139*, 6456.

Collaborations/Network:

Miquel Costas – University of Girona (Spain)