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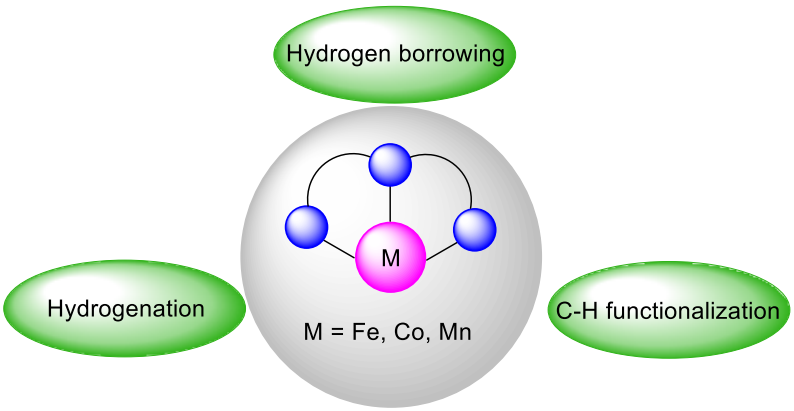
SUSTAINABLE HOMOGENEOUS CATALYSIS WITH BASE METAL COMPLEXES

Period	6 months beginning not later than: ☐ January ☐ February ☐ March ☐ April ☐ May ☐ June ☐ July ☒ September 2021
Internship supervisor(s)	name: Prof. Jean-Baptiste Sortais – Dr. Stéphanie Bastin e-mail: jean-baptiste.sortais@lcc-toulouse.fr – stephanie.bastin@lcc-toulouse.fr group: Molecular design of transition-metal pre-catalysts
Location	LCC-CNRS – Toulouse University Paul Sabatier 205 route de Narbonne - BP44099 31077 Toulouse cedex 4 - FRANCE
This research master's degree research project could be followed by a PhD	☒ YES ☐ NO

Homogeneous catalysis is a pillar of modern tools in organic synthesis. Moving towards a more sustained use of our planet resources, a great current challenge consists in the replacement of the precious and rarefying noble metals in catalytic systems by their inexpensive, earth-abundant and less toxic first row congeners (also named as "**base-metals**"). The host group has a long-standing experience in homogeneous catalysis with base metals directed toward sustainable transformation such as C-H activation,[1] hydrogen borrowing reactions[2] and hydrogenation.[3] For all these transformations, the key to success is the rational design of ligands to confer nobility to non-noble transition metals.

The objective of this internship will be to develop highly efficient catalysts based on iron, manganese and cobalt supported by innovative non-innocent ligands for green transformations (valorisation of bio-resources by hydrogen borrowing, hydrogenation or C-H functionalisation).



References:

[1] T. Dombray, C. G. Werncke, S. Jiang, M. Grellier, L. Vendier, S. Bontemps, J.-B. Sortais, S. Sabo-Etienne, C. Darcel, *J. Am. Chem. Soc*. **2015**, *137*, 4062-4065.

[2] A. Bruneau-Voisine, L. Pallova, S. Bastin, V. César, J.-B. Sortais, *Chem. Commun*. **2019**, *55*, 314-317.

[3] R. Buhaibeh, O. A. Filippov, A. Bruneau-Voisine, J. Willot, C. Duhayon, D. A. Valyaev, N. Lugan, Y. Canac, J.-B. Sortais, *Angew. Chem. Int. Ed*. **2019**, *58*, 6727-6731.

Keywords, areas of expertise	Homogeneous catalysis, Coordination chemistry, Organometallic chemistry, Earth abundant transition metals.
Required skills for the internship	Organic chemistry, coordination chemistry