



UNIVERSIDADE
NOVA
DE LISBOA

MARIE SKŁODOWSKA-CURIE INDIVIDUAL FELLOWSHIPS 2020

EXPRESSION OF INTEREST FOR HOSTING MARIE CURIE FELLOWS

HOST INSTITUTION

ITQB NOVA | Institute of Chemical and Biological Technology António Xavier

RESEARCH GROUP AND URL

Organometallic Catalysis Group

URL: <https://www.itqb.unl.pt/research/chemistry/organometallic-catalysis>

SUPERVISOR (NAME AND E-MAIL)

Beatriz Royo

E-mail: broyo@itqb.unl.pt

SHORT CV OF THE SUPERVISOR

Beatriz Royo is Principal Investigator and Head of the Chemistry Division at ITQB NOVA, University Nova of Lisbon. She graduated in Chemistry at University of Alcalá (Spain) and obtained her PhD degree in 1993 from the University of Sussex, UK, under the supervision of Prof. Michael F. Lappert. After four years in University of Alcalá as Assistant Professor, she moved to ITQB NOVA (Portugal) to join the group of C. Romão. In 2004, she started her independent career at ITQB NOVA as Head of the Organometallic Catalysis group. Her research spans the areas of synthetic organometallic chemistry and catalysis. Her group has developed sustainable catalytic methods for a range of organic transformations using Earth-abundant metals and N-heterocyclic carbene ligands. Her current research interests include hydrosilylation, hydrogen borrowing processes, oxidative coupling reactions and catalytic methods for the activation of CO₂ mediated by 3d metals.

ORCID: <https://orcid.org/0000-0002-7909-9992>

Scopus Author ID: 6602728964

5 SELECTED PUBLICATIONS

- S. A. C. Sousa, Sara Realista, B. Royo (2020). Bench-Stable Manganese NHC Complexes for the Selective reduction of Esters to Alcohols with Silanes, *Adv. Synth. Catal.* DOI:10.1002/adsc.202000148.
- M. F. Pinto, M. Olivares, A. Vivancos, G. Guisado-Barrios, M. Albrecht, B. Royo (2019). (Di)Triazolylidene Manganese Complexes in Catalytic Oxidation of Alcohols, *Catal. Sci. Technol.* 9:2421-2425. DOI: 10.1039/c9cy00685k.
- F. Franco, M. F. Pinto, B. Royo, J. Lloret-Fillol (2018). Highly Active N-heterocyclic Carbene Mn(I) Electrocatalysts for CO₂ Reduction, *Angew Chem Int. Ed.* 57:4603-4606. DOI: 10.1002/anie.201800705. Highlighted in ScienceDaily, RSC, on 6 March 2018, and in AzoCleanTech on 9 March 2018.



UNIVERSIDADE
NOVA
DE LISBOA

- M. F. Pinto, S. Friães, F. Franco, J. Lloret-Fillol, B. Royo (2018). Manganese N-Heterocyclic Carbene Complexes for Catalytic Reduction of Ketones with Silanes, *ChemCatChem* 10, 2734-2740. DOI: 10.1002/cctc.201800241. Selected as a Very Important Paper and Highlighted in the Cover of the journal.
- M. Pinto, B. Cardoso, S. Barroso, A. M. Martins, B. Royo (2016). Chelating Bis-N-heterocyclic Carbene Complexes of Iron (II) Containing Bipyridyl Ligands as Catalyst Precursors for Oxidation of Alcohols, *Dalton Trans.* 45:13541. DOI: 10.1039/C6DT02718K.

PROJECT TITLE AND SHORT DESCRIPTION

Photo-Catalytic Reduction of CO₂ Mediated by Manganese N-Heterocyclic Carbene Complexes

Inspired by natural photosynthesis, the direct utilization of sunlight for conversion of CO₂ into chemicals and fuels represents an attractive alternative to replace fossil fuels. The use of Mn as a metal centre for CO₂ reduction is an interesting approach as a way to develop cheap and sustainable metal-catalyzed systems. Our group has recently disclosed the excellent catalytic activity of a new family of Mn complexes bearing bis-N-heterocyclic carbene complexes (NHC). We demonstrated their high efficiency in the reduction of a variety of functional groups (esters, ketones, and sulfoxides), and in the electrocatalytic reduction of CO₂ to CO. The present project aims to explore the efficiency of a variety of Mn complexes bearing NHC and triazolylidene ligands (an interesting subclass of NHCs) as catalysts for the photo-reduction of CO₂.

SCIENTIFIC AREA WHERE THE PROJECT FITS BEST

Chemistry (CHE)