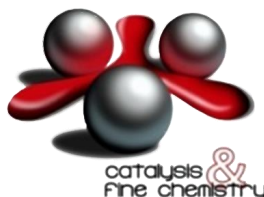
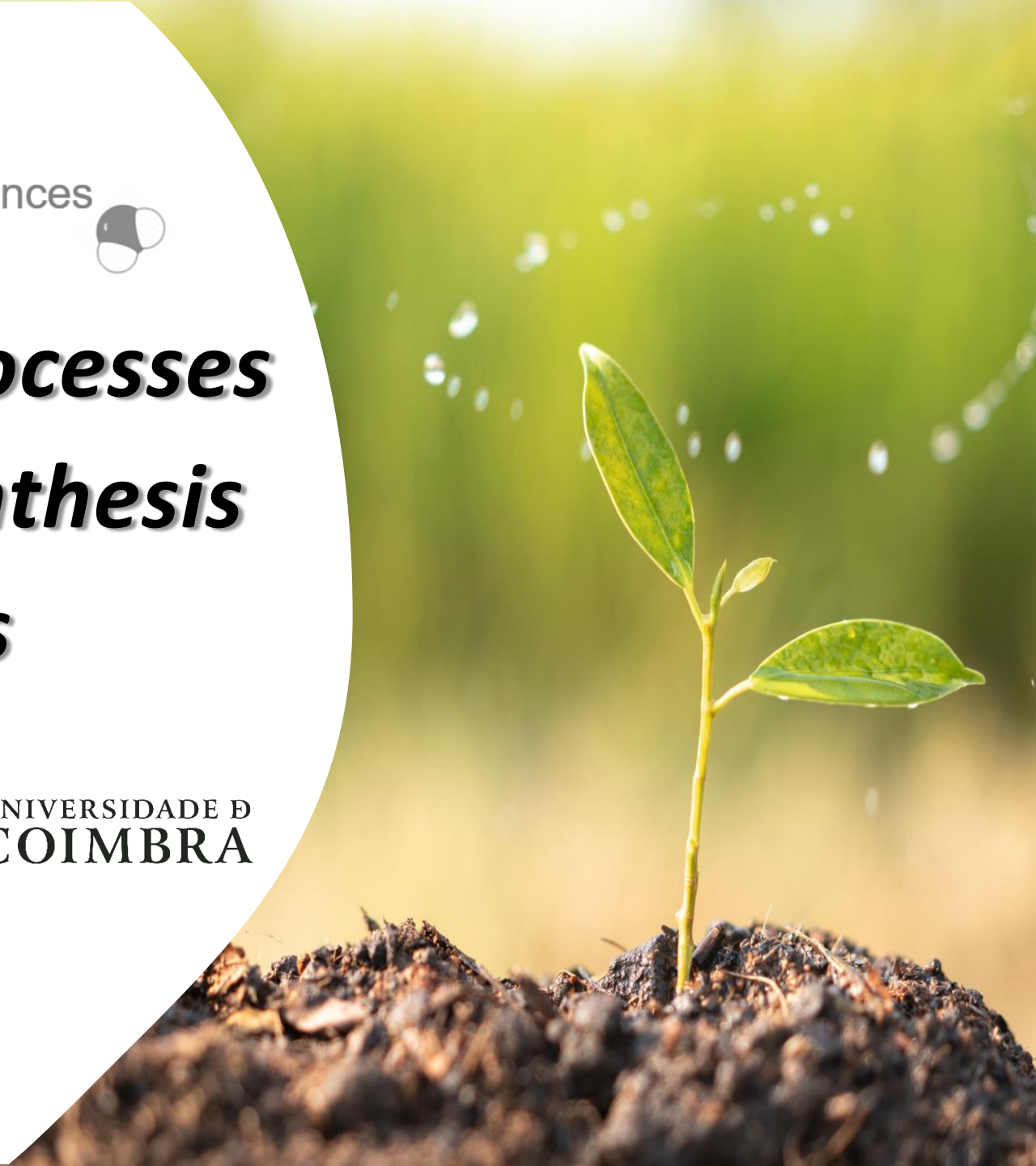


Sequential Catalytic Processes for the Sustainable Synthesis of Fine Chemicals



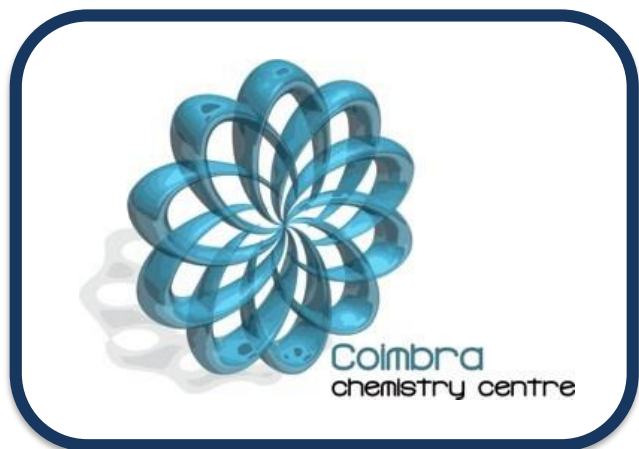
UNIVERSIDADE DE
COIMBRA


Fábio M. S. Rodrigues
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IMS - Institute of Molecular Sciences



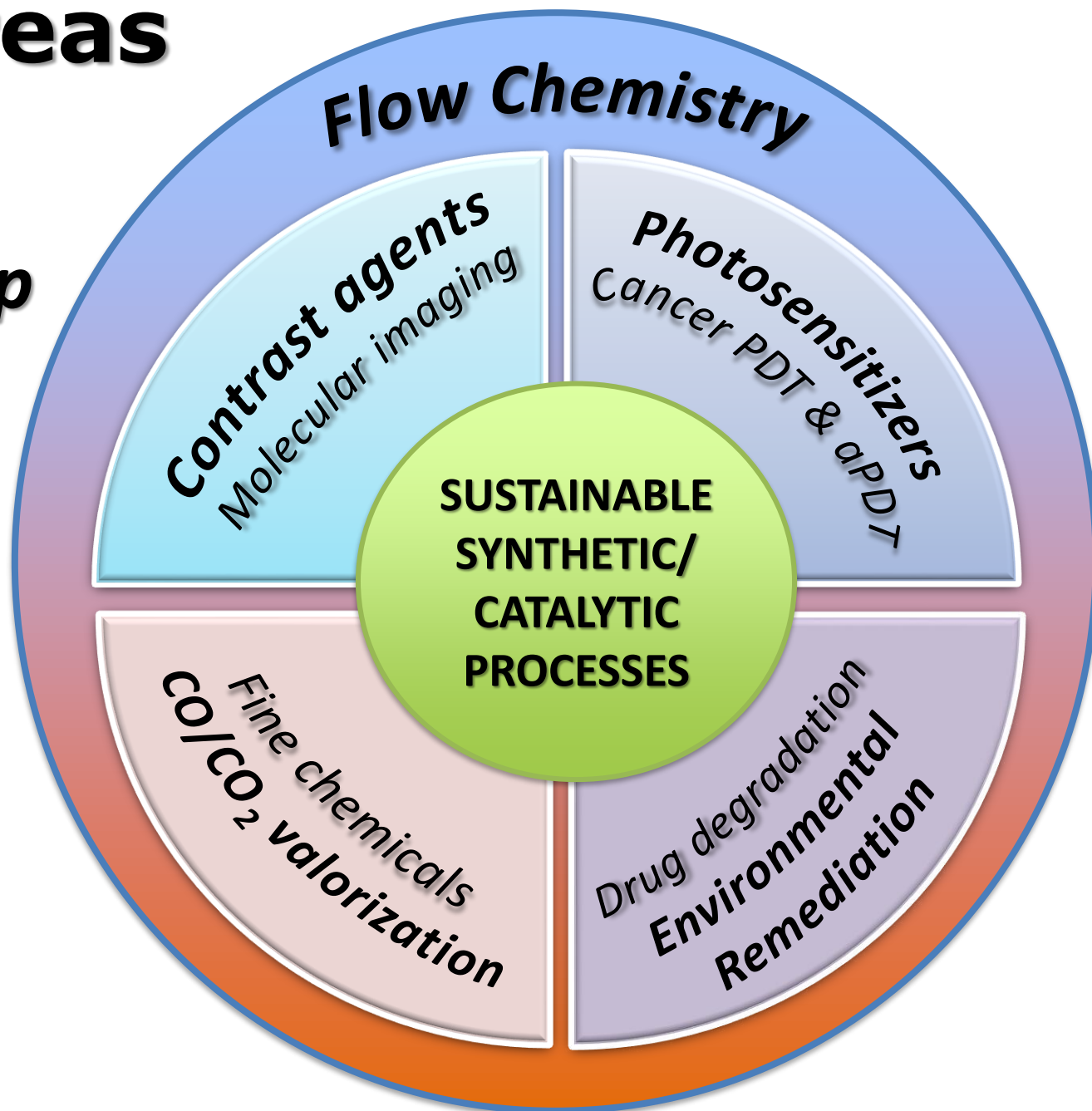
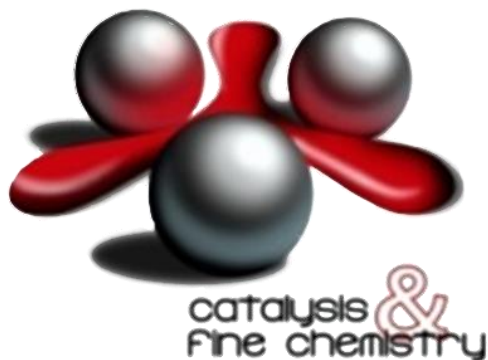
- **Theoretical and Computational Chemistry**
 - **Macromolecules, Colloids and Photochemistry**
 - **Molecular Spectroscopy and Thermodynamics**
 - **Biological Chemistry**
 - **Organic Chemistry**
 - **Medicinal Chemistry** 
- ◆ **Photomedicine and Reactivity**
 - ◆ **Catalysis & Fine Chemistry**



Research Areas

Medicinal Chemistry Group

C&FC Laboratory

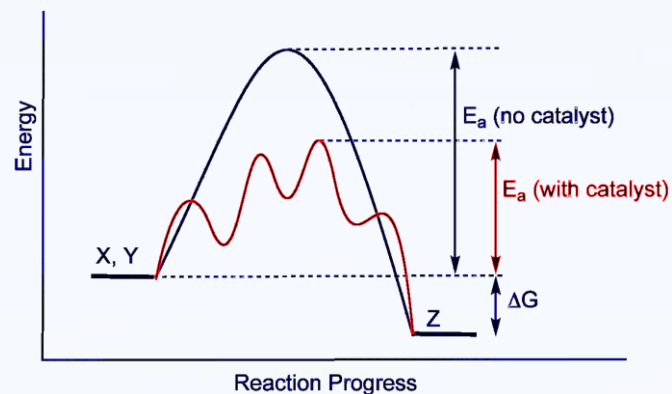


- Catalysis**

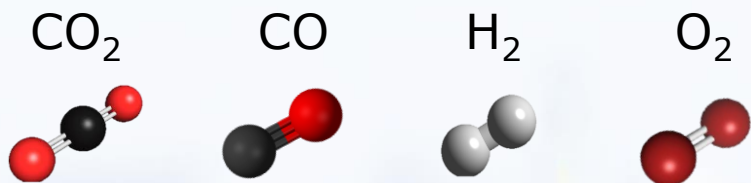
Low energy consumption

Selective reactions

Low waste generation

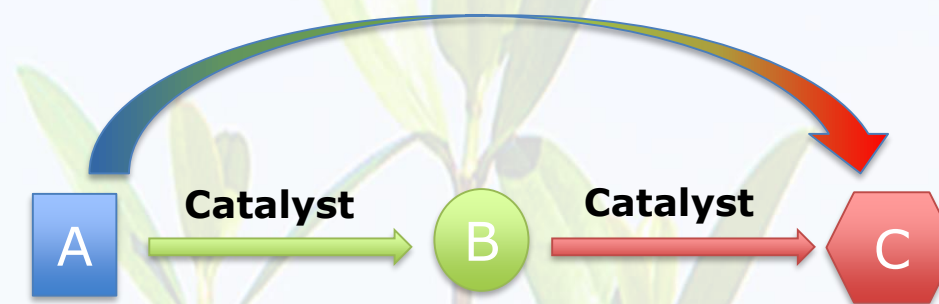


- Gas molecules activation**



Renewable feedstocks

- Sequential processes**

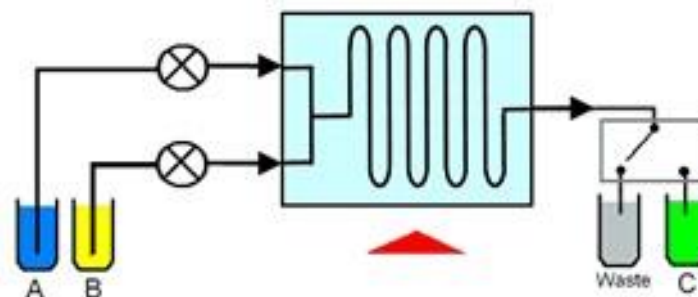
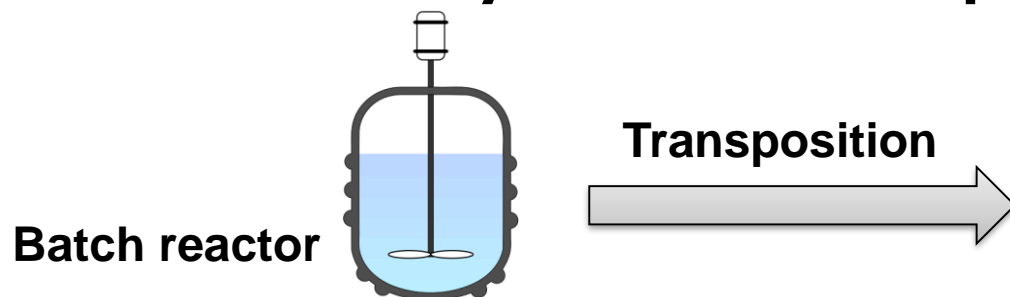


Reduce waste production

Avoid solvents and intermediate purification

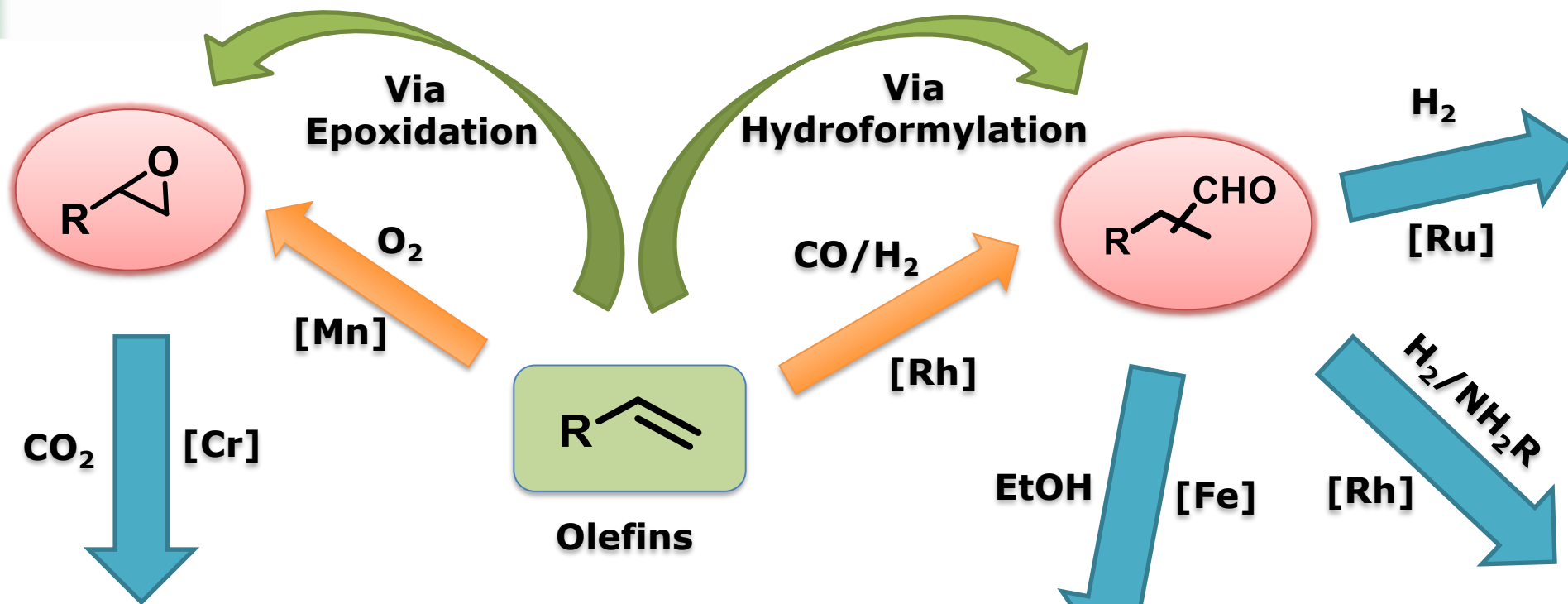
One-pot synthesis of complex molecules

- Fine chemicals synthesis scale-up**

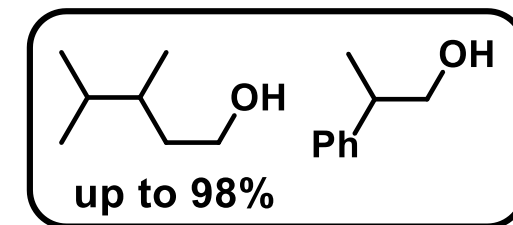


Continuous flow processes

SEQUENTIAL CATALYTIC PROCESSES

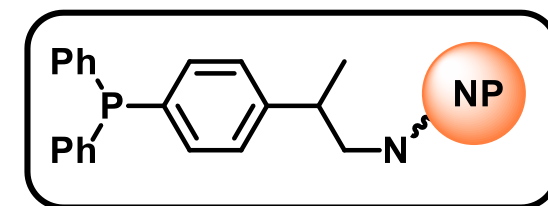


Alcohols

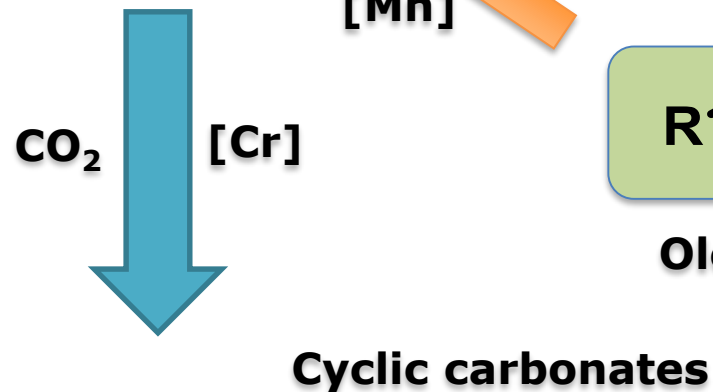


Rodrigues *et al*, *ChemSusChem* **2018**, 11, 2310

Amine-Immobilized P ligands

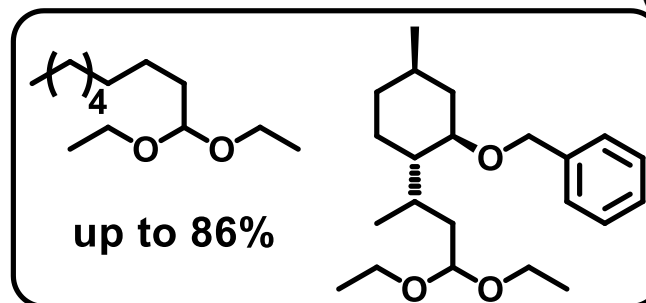


Rodrigues *et al*, *Catal. Today* **2020**, 356, 456



Carrilho & Pereira,
ChemCatChem **2018**, 10, 2792

Acetals

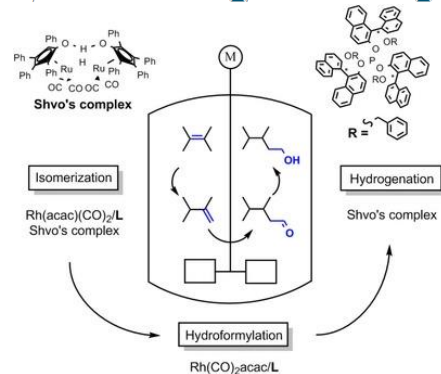


Rodrigues *et al*, *Catalysts* **2021**, 11, 608

Communication

Dual Rh–Ru Catalysts for Reductive Hydroformylation of Olefins to Alcohols

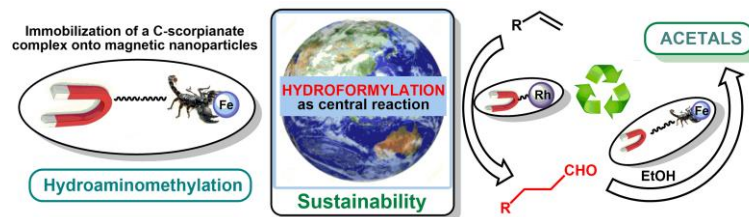
Fábio M. S. Rodrigues, Peter K. Kucmierczyk, Prof. Dr. Marta Pineiro, Dr. Ralf Jackstell, Prof. Dr. Robert Franke, Prof. Dr. Mariette M. Pereira ✉, Prof. Dr. Matthias Beller ✉



Article

Immobilization of Rh(I)-N-Xantphos and Fe(II)-C-Scorpionate onto Magnetic Nanoparticles: Reusable Catalytic System for Sequential Hydroformylation/Acetalization

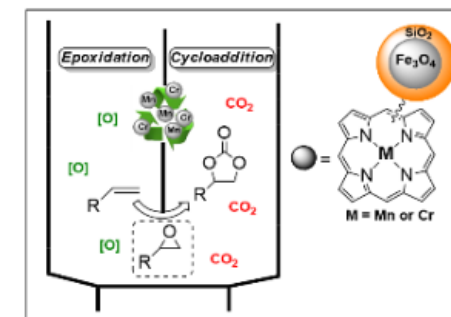
Fábio M. S. Rodrigues ¹, Lucas D. Dias ^{1,2}, Mário J. F. Calvete ¹, Teresa M. R. Maria ¹, Liane M. Rossi ³, Armando J. L. Pombeiro ⁴, Luísa M. D. R. S. Martins ⁴ and Mariette M. Pereira ^{1,*}



Full Paper

Hybrid Metalloporphyrin Magnetic Nanoparticles as Catalysts for Sequential Transformation of Alkenes and CO₂ into Cyclic Carbonates

Lucas D. Dias, Dr. Rui M. B. Carrilho ✉, Dr. César A. Henriques, Dr. Mário J. F. Calvete, Prof. Anna M. Masdeu-Bultó, Prof. Carmen Claver, Prof. Liane M. Rossi, Prof. Mariette M. Pereira ✉



Continuous flow processes

CO₂ Capture/Valorization for Fine Chemical Synthesis (CO₂Biofilter)

Prémio Semente de Investigação Interdisciplinar (Área Estratégica Clima, Energia e Mobilidade), Universidade de Coimbra/Santander Universidades, 2022.

PI: Rui M. B. Carrilho

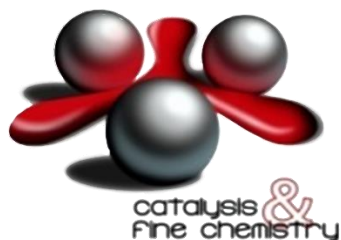


Acknowledgements

International collaborations

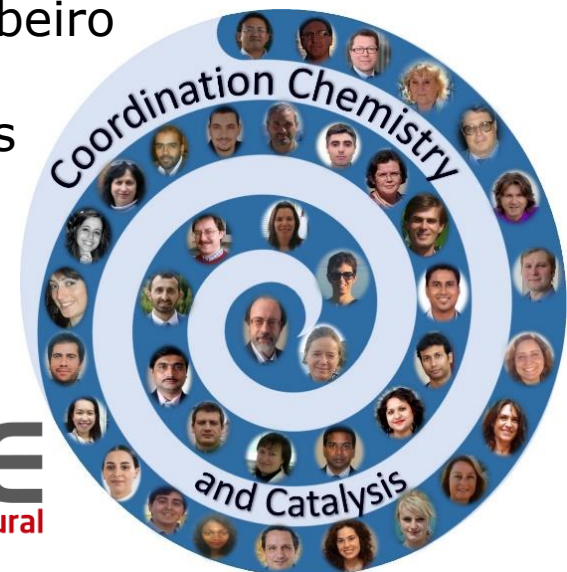
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E. Dos Santos (UMG)

M. Beller (LIKAT-RU)
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A. Masdeu-Bultó (URV)
J.C. Bayón (UAB)
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A. Grabulosa (UB)
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T. Kégl (UP)
V. Bagnato (USP)
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Luísa Martins
Fátima Guedes
João Tomé
Filipa Ribeiro



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PTDC/QUI-OUT/27996/2017 (DUALPDI)

Prémio Semente - UC/Santander 2022

FCT

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