

# The Chemist's Interactions

Seminars @ the Chemistry Department

Friday, 26<sup>th</sup> February 2021



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LIVE  
STREAM  
h 14:30

## Redox-switchable Catalysts

For many years, research in catalysis has mainly focused on the development of new catalysts and the optimization of their performance to achieve high conversion and selectivity. Inspired by nature, scientists are now also looking at possibilities to develop catalysts that change their activity and/or selectivity in response to an external stimulus, such as light, changes in pH or redox reactions. Among the external stimuli, redox-switchable catalysis (RSC) is a field of growing importance in which redox-active functionality is incorporated in a ligand framework to allow the catalytic activity of the coordinated metal centres to be influenced in situ. Oxidation and reduction influence the electron-donating ability of the ligand and thus result in altered activity or selectivity of the catalyst, which may facilitate a new transformation altogether. The ultimate goal is to design a catalyst displaying orthogonal activity for different substrates on changing its electronic nature. Thus, catalysts have been switched to change their solubility (for catalyst recycling) or to modulate the activity of the transition metal (electronic communication between the redox-active group and the catalytic centre). In our group, we are focusing on ferrocene-based switchable catalysts, including those grafted to the surface of dendrimers<sup>[1]</sup> or novel  $C_3$ -symmetric tris(ferrocenyl)-arene-based tris-phosphanes.<sup>[2]</sup> In this presentation, an overview on switchable catalysts will be given with a specific emphasis on RSC.

[1] P. Neumann et al., *Angew. Chem. Int. Ed.* **2015**, 54, 311; *Chem. Eur. J.* **2015**, 21, 6590.

[2] A. Straube et al., *Chem. Eur. J.* **2020**, 26, 5758; *Chem. Sci.* **2020**, 11, 10657; *Dalton Trans.* **2020**, 49, 16667.



The Virtual Seminar Series will be broadcast with the Zoom software.

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