

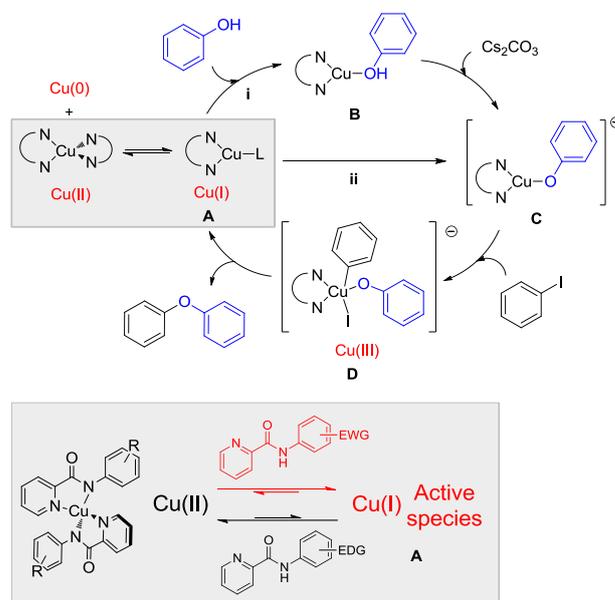
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The development new complexes for Cu-Catalysed Aryl Ether Formation

Cu catalysis has been extended to the functionalisation of unsubstituted arenes, which are cheaper and have (green) advantages such as the avoidance of halogen side-products and the use of air or oxygen as oxidants. We have been interested in on Ullmann-type reactions (namely those Cu-catalysed arylations in which aryl halides are involved).¹ The range of nucleophiles suitable for Ullmann arylations has become wider with time, and nowadays N-, O-, S-, P- and C-aryl bonds formation are easily accessible through these processes. Such bonds can be found in many bioactive organic compounds, as well as in material chemistry. We have recently reported the use of *N*-arylpicolinamide ligands for the synthesis of aryl ethers. Structure-activity relationship study has led to the discovery of a very effective ligand, even under aerobic conditions.²⁻³ We have also been interested in the role of the base in such reactions.³



Scheme 1

Different projects are available in this area, for example in: (i) effects of different metal oxidation states and roles of anions on catalysis; (ii) effects of different; (iii) immobilisation of the catalyst onto an inert surface.

Project work will involve *multi-step organic synthesis* of ligands; *synthetic coordination chemistry*; investigations of the *catalytic behaviour* of the metal complexes, and their solution characterisation using mass spectrometry, Cyclic Voltammetry and EPR; all aspects of *single crystal X-Ray structure determination*. We collaborate with Prof. John Blacker, Prof. Steve Marsden and Dr. Bao Nguyen

References

1. C. Sambigioglio, R. H. Munday, A. J. Blacker, S. P. Marsden and P. C. McGowan, *RSC Advances*, **2016**, 6, 70025-70032
2. S. P. Marsden, A. J. Blacker and P. C. McGowan, *Chem. Soc. Rev.*, **2014**, **43**, 3525-3550.
3. C. Sambigioglio, S. P. Marsden, A. J. Blacker and P. C. McGowan, *Chem. Eur. J.*, **2014**, 17606-17615.