"Iron Complexes for C-C Cross-coupling and Olefin Epoxidation"

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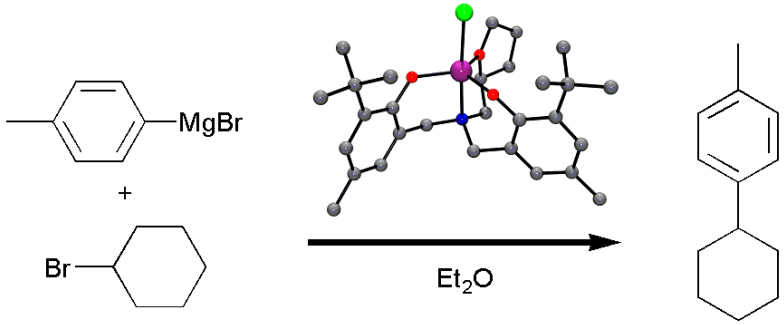
The "mammoth effort"[1] over the past 30 years devoted to palladium and nickel catalysts may have overshadowed the reports of alternative metal complexes used for the formation of carbon-carbon and carbon-heteroatom bonds, and other processes. However, growing economic and environmental concerns has brought to the forefront the search for alternative catalysts that address disadvantages associated with the use of palladium and nickel. Iron is an ideal candidate to fill this need and new iron-catalyzed reactions are entering the synthetic organic chemists' toolbox. Interestingly, the first iron-catalyzed reactions date back to the 1960s, when late transition metal catalysis using palladium, ruthenium and rhodium was still in its infancy. It now appears that iron-mediated catalysis is experiencing a renaissance. Our research efforts involve the development and study of new, easily prepared single component iron catalysts, as well as their physical and spectroscopic characterization. This talk will present the contributions of our group to the areas of C-C cross-coupling catalysis and the iron-catalyzed epoxidation of olefins using hydrogen peroxide.[2]



[1] B. D. Sherry and A. Fürstner, *Acc. Chem. Res.*, **2008**, *41*, 1500–1511.
[2] K. Hasan, N. Brown and C. M. Kozak*. *Green Chem.* **2011**, *13*, 1230; X. Qian and C. M. Kozak*. *Synlett*, **2011**, *6*, 852; X. Qian, L. N. Dawe and C. M. Kozak*. *Dalton Trans.*, **2011**, *40*, 933; R. Roy Chowdhury, A. K. Crane, C. Fowler, P. Kwong and C. M. Kozak*. *Chem. Commun.*, **2008**, 94

"Catalysis and Nanoparticle Formation Using Ionic Liquids"

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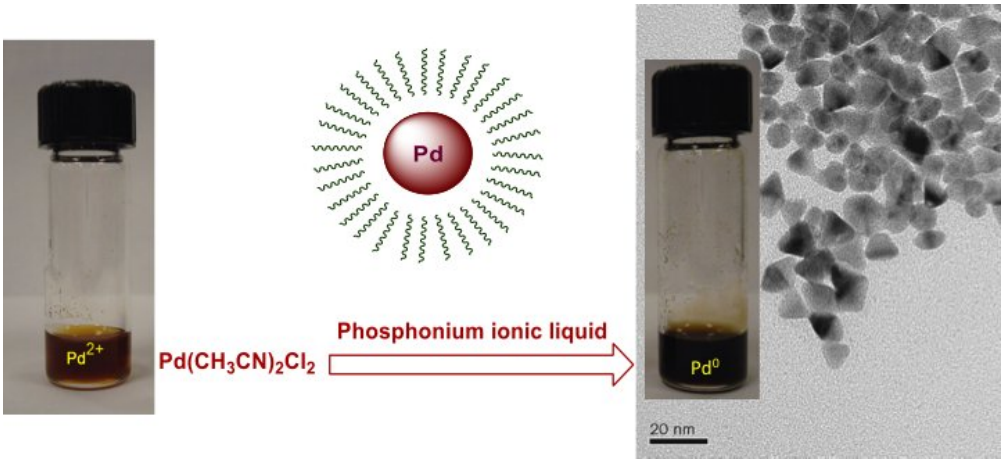
Published and unpublished results from the Kerton group will be presented. Our group has been studying catalytic transformations of alcohols over the past four years. During these studies, we have found that ionic liquids are able to participate in reactions in a number of ways: (i) Stabilize ionic intermediates and encourage phase separation in dehydration reactions, (ii) Act as reducing and stabilizing agents during palladium nanoparticle formation, (iii) Act as a catalyst.



Key references: (i) *Chem. Commun.* 2009, 5171-5173; (ii) *Green Chem.* 2011, **13**, 681-686; (iii) *Adv. Synth. Catal.*, 2011, **353**, 3178-3186.