



Exploiting Multicomponent Reagents in Synthesis: Stepwise vs Synchronised Cooperative Behaviours

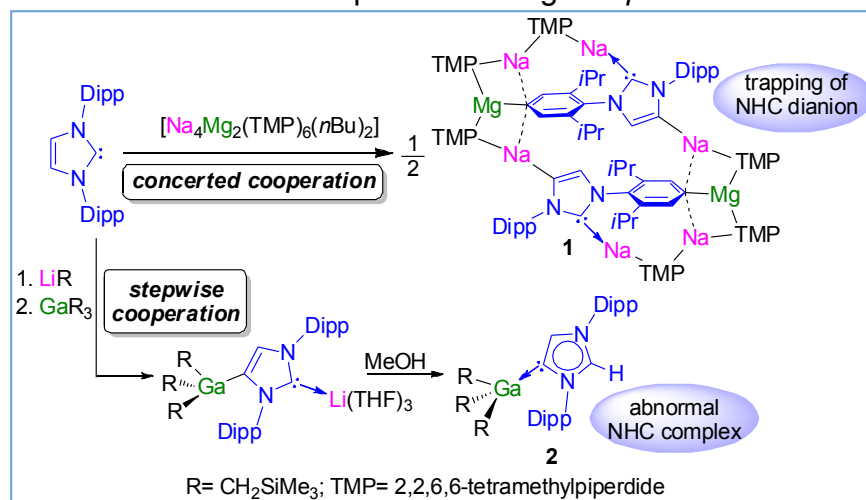
Eva Hevia

WestCHEM, University of Strathclyde, 295 Cathedral Street, Glasgow, UK

Eva.hevia@strath.ac.uk

Multicomponent bimetallic organometallic reagents are capable of producing new chemistry irreproducible by either of their single organometallic components.^[1] However, recent work^[2] has revealed that such heterobimetallic reagents do not necessarily need to form mixed-metal compounds in order to exhibit this unique cooperative behaviour, as they can alternatively operate in a stepwise process.

This talk firstly reviews our new results using cooperative bimetallics to promote deprotonative metallations, operating either in a synchronised or stepwise manner. These approaches have established novel ways to trap dianionic NHC (N-heterocyclic carbene) fragments in reactions of unprecedented chemoselectivity (**1** in Figure)^{3a} and to access elusive main group abnormal NHC complexes^{3b} (**2** in Figure). Secondly, the opening applications of mixed ammonium-magnesiates and lithiate salts in Green Chemistry will be revealed through addition reactions of Grignard reagents to ketones under air and at room temperature using *Deep Eutectic Solvents*.⁴



References:

1. F. Mongin, A. Harrison-Marchand, *Chem. Rev.* **2013**, *113*, 7563.
2. (a) S. E. Baillie, T. D. Bluemke, W. Clegg, A. R. Kennedy, J. Klett, L. Russo, M. de Tullio, E. Hevia *Chem. Commun.* **2014**, 50, 12859. (b) D. R. Armstrong, E. Crosbie, E. Hevia, R. E. Mulvey, D. L. Ramsay, S. D. Robertson, *Chem. Sci.* **2014**, *5*, 3031.
3. (a) M. Uzelac, A. Hernán-Gómez, D. R. Armstrong, A. R. Kennedy, E. Hevia, *Chem. Sci.* **2015**, *6*, 5719. (b) A. Martínez, M. A. Fuentes, A. Hernán-Gómez, E. Hevia, A. R. Kennedy, R. E. Mulvey, C. T. O'Hara, *Angew. Chem. Int. Ed.* **2015**, *54*, 14075.
4. (a) C. Vidal, J. Garcia-Alvarez, A. Hernan-Gomez, A. R. Kennedy, E. Hevia, *Angew. Chem. Int. Ed.* **2014**, *53*, 5969. (b) V. Capriati, J. Garcia-Alvarez, E. Hevia, *Eur. J. Org. Chem.*, **2015**, 6779