The Quest for a Sustainable Polar Organometallic Chemistry: Solvent Effects on Metallation Reactions

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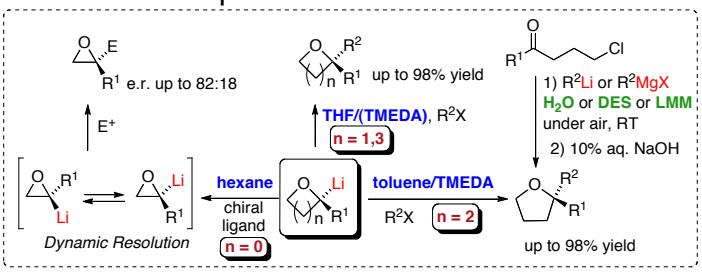
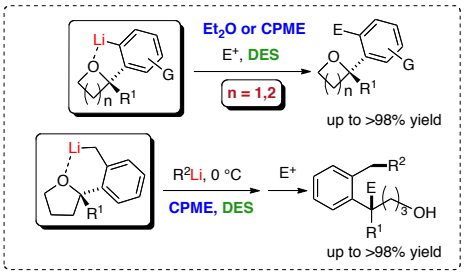
Abstract: The environmental impact associated with chemical synthesis has recently posed severe and compelling demands for sustainable chemistry, and the development of cost-effective and environmentally benign reaction systems in place of volatile and harsh organic compounds represents an active field of research. Polar organometallic chemistry has become a cornerstone of modern organic synthesis, however, with an heavy impact on the environment.[1] The burgeoning field of oxygen heterocycles has also seen significant breakthroughs over the last ten years particularly because of the blossoming of new lithiation methodologies for the preparation of more functionalised derivatives in which the *solvent* proved to play a central role in mediating the degree of aggregation, and thus the reactivity of the corresponding organolithium compounds. Contributions from this laboratory to the development of such lithiation strategies will be revealed.[2] In addition, this lecture will discuss the potential benefits of using environmentally friendly, bio-based "deep eutectic solvents" (DESs), low melting mixtures (LMMs) based on carbohydrates/urea,[3] and more challengingly also water[4] as effective, unconventional reaction media for s-block-metal-mediated organic transformations run at room temperature and under air.





References: 1. García-Álvarez, J.; Hevia, E.; Capriati, V. *Eur. J. Org. Chem.* **2015**, 6779. 2. (a) Coppi, D. I.; Salomone, A.; Perna, F. M.; Capriati, V. *Chem. Comm.* **2011**, *47*, 9918; (b) Coppi, D. I.; Salomone, A.; Perna, F. M.; Capriati, V. *Angew. Chem. Int. Ed.* **2012**, *51*, 7532; (c) Mansueto, R.; Mallardo, V.; Perna, F. M.; Salomone, A.; Capriati, V. *Chem. Comm.* **2013**, *49*, 10160; (d) Mansueto, R.; Perna, F. M.; Salomone, A.; Florio, S.; Capriati, V. *Chem. Comm.* **2013**, *49*, 4911; (e) Salomone, A.; Perna, F. M.; Falcicchio, A.; Nilsson Lill, S. O.; Moliterni, A.; Michel, R.; Florio, S.; Stalke, D.; Capriati, V. *Chem. Sci.* **2014**, *5*, 528; (f) Cicco, C.; Addante, V.; Temperini, A.; Donau, C.; Karaghiosoff, K.; Perna, F. M.; Capriati, V. *Eur. J. Org. Chem.* **2016**, DOI: 10.1002/ejoc.2001600365. 3. (a) Mallardo, V.; Rizzi, R.; Sassone, F. C.; Mansueto, R.; Perna, F. M.; Salomone, A.; Capriati, V. *Chem. Comm.* **2014**, *50*, 8655; (b) Sassone, F. C.; Perna, F. M.; Salomone, A.; Florio, S.; Capriati, V. *Chem. Comm.* **2015**, *51*, 9459. 4. Cicco, L.; Sblendorio, S.; Mansueto, R.; Perna, F. M.; Salomone, A.; Florio, S.; Capriati, V. *Chem. Sci.* **2016**, *7*, 1992.