

Functional Ionic Liquids Made with Dimethylcarbonate: Bicarbonate Turned into a Strong Enough Base to Catalyse Michael Reactions.

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Ionic liquids have elicited phenomenal interest among chemists who develop novel systems for clean catalysis,¹ a limitation of ionic liquids lies in their manufacturing process, that is often poorly environmentally compatible^{2,3}. In this work, we describe both a green methodology for the synthesis of a class of methyl-ammonium and methyl-phosphonium ionic liquids, and the application of these ionic liquids as highly active basic catalysts for carbon-carbon bond forming reactions. In particular, the methylation of tertiary amines or phosphines has been carried out with dimethylcarbonate to produce halogen-free methyl-onium methylcarbonate salts. These latter can be easily anion exchanged to yield a range of derivatives with diverse physical and chemical properties. Among them, the bicarbonate exchanged liquid onium salts proved basic enough to promote the Michael reaction. The present work also introduces neat NMR spectroscopy of the ionic liquids as a probe for solute-solvent interactions as well as a tool for characterisation.

1. Pârvulescu, V. I.; Hardcare, C. *Chem. Rev.* **2007**, *107*, 2615-2665.

2. Sheldon, R. *Chem. Commun.* **2001**, 2399-2407.

3. Welton, T. *Chem. Rev.* **1999**, *99*, 2071-2083.