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Ionic Liquids as efficient and reusable catalysts for phenylselenoetherification of alkenols

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The cyclofunctionalization of alkenes bearing a suitable oriented nucleophile (OH, COOH, NHCOR) by means of electrophilic selenium species presents a powerful methodology for the construction of different O- and N-containing heterocycles [1]. Safety and environmental concerns demand new sustainable synthetic methods for these types of transformations. Ionic liquids (ILs) have emerged as a promising choice for their implementation in the organoselenium area due to their unique physicochemical properties such as negligible vapour pressure at ambient conditions [2]. Herein, we present a novel approach for IL-mediated selenocyclofunctionalization of unsaturated alcohols and acids. First, the performance of a variety of ILs in the selenocyclization of 4-penten-1-ol was studied. An IL was then selected as reaction medium and a variety of unsaturated alcohol and acids were smoothly converted into the corresponding cyclic products by reaction with PhSeCl. All reactions proceeded at r.t. and were completed in very short reaction times with high yields and regioselectivities. Moreover, the IL could be reused up to five times without significant loss of activity.

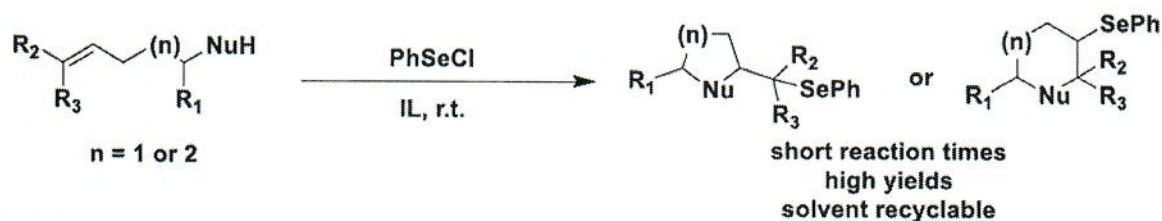


Figure 1. IL-mediated selenocyclofunctionalization

1. C. Santi, *Organoselenium Chemistry Between Synthesis and Biochemistry*, Bentham Science Publishers, 2014.
2. J.P. Hallett and T. Welton, *Room Temperature Ionic Liquids: Solvents for Synthesis and Catalysis*, *Chem. Rev.*, 111 (2011) 3508–3576.