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Recyclable ionic liquids as catalysts for fine chemical production

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Over the past 20 years, ionic liquids, supercritical fluids and water have become powerful alternatives to conventional organic solvents. Because of their properties, which include an undetectable vapour pressure, the ability to dissolve numerous organic and inorganic substances, high thermal stability, and a wide liquid phase range, ionic liquids have become one of the most promising new reaction media. The term “green solvents” has been used to describe ionic liquids because of their negligible vapour pressure. Significant efforts have been made to design “fully green”, non-toxic and biodegradable ionic liquids using renewable compounds as the starting materials. The synthesis of ionic liquids from environmentally sustainable and renewable raw materials is becoming more reasonable compared with the use of compounds derived from fossil feed stocks. Sugars appear to be suitable precursors for ionic liquids because they are among the most abundant and relatively inexpensive naturally occurring substances available. Research involving sugars for the preparation of ionic liquids has been limited and has only recently come to the forefront. There is continued pressure on chemical and pharmaceutical industries to reduce chemical waste and improve the selectivity and efficiency of synthetic processes. Case studies concerning the recoverable and recyclable catalysts for chemical processes like Diels-Alder reaction will be presented. The main emphasis will be placed on the application of ionic liquids as catalysts. The prevention of waste can be achieved if most of the reagents and the solvent are recyclable. The design and synthesis of recoverable catalysts will be demonstrated.

Biography

Karolina Matuszek, has completed her study in 2012 from Silesian University of Technology, Faculty of Chemistry, specialization Chemical Technology. She is a third grade PhD student in the Department of Chemical Organic Technology and Petrochemistry at Silesian University of Technology, Faculty of Chemistry (Gliwice, Poland). Her main fields of interests are: chemical technology, green chemistry, oxidation processes, alkylation processes and ionic liquids.

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