

Polycarbonate depolymerization promoted by Task-Specific Ionic Liquids and Ultrasound

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Plastic is ubiquitous in our daily life, and million tons of plastic are produced each year. Inefficient disposal led to accumulation of plastic waste in environment. Chemical recycling to monomers (CRM) is a viable strategy to tackle this problem.¹ In this regard, we investigated depolymerization of polycarbonate into bisphenol A. In the framework of our interest in plastic chemical recycling,^{2,3} we combined ultrasound and task specific ionic liquids as an environmentally friendly strategy for solvolysis of polycarbonate (PC). In particular, we focused on methanolysis to recover bisphenol A (BPA) using task specific ionic liquids as catalysts, differing for the cation and anion. We also performed propanolysis, butanolysis and etanolysis of the polymer.

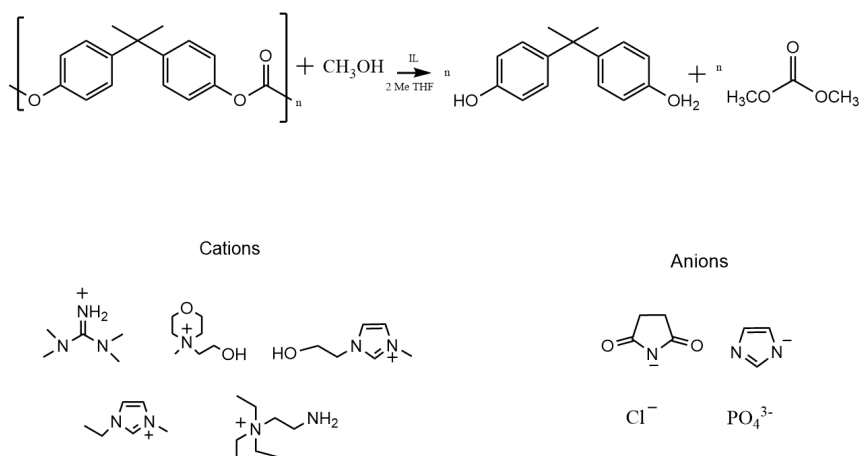


Figure 1: Methanolysis reaction and Task-Specific ILs used.

The results obtained show that the catalyst chosen are efficient in promoting the reaction, which could be performed under mild conditions, at 30 °C, in agreement with the principles of Green Chemistry, observing good to high yields in BPA. Examination of the effect of the IL components showed that the best performing catalyst bear the imidazolone anion.

References:

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