

Supported ionic liquids on polystyrene for the synthesis of cyclic carbonates from CO₂ and allyl glycidyl ether

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Ionic liquids immobilized on polymer is an effective heterogeneous catalyst for synthesizing cyclic carbonates from CO₂. By the increasing concentration of carbon dioxide in the atmosphere, industrial revolution has given rise to widespread concern about the possible consequences. As an effective sequestration for CO₂, it can be used as an environmentally benign feedstock for the synthesis of polycarbonate or cyclic carbonate. Due to the low toxicity, biodegradability and high boiling point, cyclic carbonates find application as useful solvents and chemical intermediates. In this work, the catalytic activity studies were performed for the cycloaddition of carbon dioxide to allyl glycidyl ether (AGE) to produce a five-membered cyclic carbonate. The ionic liquid supported on polystyrene was characterized by EA and ¹³C-NMR. The synthesis of cyclic carbonate from AGE and CO₂ was performed at 80–140 °C under 80–180 psi of CO₂ pressure. All polymer supported ionic liquid catalysts showed good catalytic activity without using any solvent. High temperature, long reaction time and high CO₂ pressure is found to be favorable for high AGE conversion.