

Cycloaddition of Carbon Dioxide to Propylene Oxide Catalyzed by Silica Supported Ionic liquids and Metal Halides

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CO₂, which is considered as a major greenhouse gas, has received much attention in industry. Because CO₂ is recognized to be a naturally abundant, cheap, recyclable and non-toxic carbon source that can sometimes replace toxic chemicals. The cycloaddition of CO₂ to epoxide to produce cyclic carbonate is one of the industrial processes that utilize CO₂. Cyclic carbonate has several applications as electrolyte components in lithium batteries, aprotic polar solvents, chemical intermediates and monomers in the production of pharmaceutical and fine chemicals. Ionic liquids immobilized on silica is an effective heterogeneous catalyst for synthesizing cyclic carbonates from CO₂. In this work, metal-ion containing silica supported ionic liquids were prepared, and their catalytic performance was studied for the cycloaddition of carbon dioxide to propylene oxide (PO) to produce propylene carbonate. IL-ZnCl₂/silica showed good catalytic performance as a heterogeneous catalyst.