

Polymer Supported Quaternized Ammonium Catalysts For Cyclic Carbonate Synthesis

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CO₂, which is considered as a major green house 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 as a raw material. This study, polymer supported quaternized ammonium catalysts were fabricated and evaluated as a catalyst in the cycloaddition of CO₂ to allyl glycidyl ether (AGE) to form 5-membered cyclic carbonate. The catalysts exhibited good catalytic activity for the synthesis of the cyclic carbonate from the other epoxides and carbon dioxide also. The effects of reaction parameters such as temperature, reaction time, CO₂ pressure and catalyst amount on the reactivity of the catalysts were studied. The catalysts were characterized by Elementary Analysis (EA), X-ray photoelectron spectroscopy (XPS), FT-IR and SEM. In addition, the catalyst recycle test show that the polymer supported catalyst could be reused for five times without a significant reduction in the activity.