

Synthesis Of Glycerol Carbonate By Glycerolysis Of Urea Using Metal Containing Ionic Liquid Catalysts

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The utilization of biomass and biodiesels in particular is now well established as a green alternative to reduce carbon emissions. One major drawback in the biodiesel industry is the production of large amounts desired glycerol as a by product during the transesterification process which contributes a large surplus in the current glycerol market. Glycerol carbonate (GC), which can be synthesized from glycerol, is a new and interesting material in the chemical industry. In this study, we reported the catalyzed synthesis of GC from glycerol and urea using metal containing ionic liquids, $(RIm)_2ZnX_2$, which were prepared by a metal insertion reaction. The synthesized $(RIm)_2ZnX_2$ exhibited good catalytic performance during synthesis of GC from glycerol and urea. $(HEIm)_2ZnCl_2$ with a hydroxyl group exhibited the highest GC yield owing to incorporation of acid-base bifunctional active sites. $(EIm)_2ZnX_2$ catalysts based on different halide anions showed increased reactivity as $Cl^- < Br^- < I^-$, which is the order of nucleophilicity. The effects of reaction parameters on the reactivity were also investigated.