Synthesis of Glycerol Carbonate from Glycerol and Dimethyl Carbonate; Catalyst Screening and Characterization

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Recently, glycerol carbonate is attracts much interest as a novel component of gas separation membranes, polyurethane foams, a surfactant component and a nonvolatile solvent for several type of materials. This work investigates the synthesis of glycerol carbonate from glycerol and dimethyl carbonate by transesterification using various heterogeneous catalysts. Some metal oxide catalysts, such as Zr, Ca and Mg based catalyst were tested for the reaction. Optimum reaction conditions including temperature, reaction time, catalyst/glycerol molar ratio and dimethyl carbonate/glycerol molar ratio were investigated. The fresh and used catalysts were characterized by X-ray Diffraction (XRD), IR spectroscopy, and TPD experiments.