

Synthesis of glycerol carbonate by transesterification of glycerol with dimethyl carbonate over mesoporous $\text{LiAlO}_2/\text{MO}_2$ (SnO_2 , ZrO_2 , CeO_2) catalysts

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In this work, transesterification of glycerol with DMC to yield glycerol carbonate (GC) was examined using highly ordered mesoporous ZrO_2 , SnO_2 and CeO_2 with high surface areas as supports to load the basic sites LiAlO_2 by incipient wetness impregnation method. The synthesized catalysts were characterized using various physicochemical characterization techniques, namely, XRD, N_2 -sorption, CO_2 -TPD and FT-IR. In the transesterification reaction, $\text{LiAlO}_2/\text{CeO}_2$ exhibited the best catalytic activity, due to the number of basic sites existed on the surface of catalyst, indicated that the basicity of supported LiAlO_2 catalysts was found to be highly dependent on the nature of the supports. The mesoporous $\text{LiAlO}_2/\text{CeO}_2$ catalysts with different LiAlO_2 loadings (5~20) wt.% also prepared and tested for transesterification reaction. The results revealed that the transesterification activity depended on the amount of LiAlO_2 loading and calcinations temperature of the catalysts. The effect of reaction conditions such as DMC/glycerol molar ratio, reaction temperature, and catalyst amount were also discussed.