

Functionalized Metal-Organic Frameworks as Catalysts for the Synthesis of Glycerol Carbonate from Glycerol and Urea

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Metal-organic frameworks(MOFs) are crystalline coordination polymers built from organic linkers and inorganic nodes, and have potential applications in gas separation, store, sensors, and catalysis. In principle, these metal-organic structures exhibit the potential for more flexible rational design by controlling the functionalization of the organic linkers. In this study functionalized isorecticular metal-organic frameworks(F-IRMOFs) were prepared by (post)-functionalization of IRMOFs and the catalysts have been characterized by XRD, FT-IR, BET, and ¹³C NMR. We investigated the influence of the functional group and structure of MOF series as catalyst for the synthesis of glycerol carbonate from glycerol and urea. The reaction was carried out in a semi-batch reactor system, under vacuum or purging nitrogen for removing ammonia. Various operation conditions such as reaction temperature, time and degree of vacuum were studied. It was found that higher temperature and vacuum and longer reaction time were favorable for glycerol conversion.