

Efficient hydrogenolysis of glycerol to 1,3-Propanediol using Platinum containing acidic catalysts

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Glycerol is a main byproduct in the biodiesel production by transesterification of vegetable oils and animal fats, and large quantities of glycerol become available due to the rapid development of biodiesel process. Until now, a great deal of effort has been put toward the utilization of glycerol. Recently, hydrogenolysis of glycerol to 1,3-Propanediol (1,3-PDO) has attracted much attention. This process provides a clean and economically competitive route for the production of the commercial chemicals from renewable glycerol instead of from nonrenewable petroleum. 1,3-PDO is a valuable chemical used in the synthesis of polymethylene terephthalates and in the manufacture of polyurethanes. In this work, glycerol hydrogenolysis to 1,3-PDO was performed over Platinum containing acidic catalysts prepared by impregnation. Yield of 1,3-PDO reaches 55.8%. In addition, we found that the catalyst is active and stable up to 3 cycles through the study of the recyclability of the catalyst. Those highly active catalysts were characterized by X-ray diffraction(XRD), NH₃ temperature-programmed desorption(NH₃-TPD).