



Selective hydrogenolysis of glycerol to propanediols over supported Pt-Re/WO₃/ZrO₂ catalysts

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Biodiesel is an alternative biodegradable and renewable diesel fuel which can replace petroleum diesel in the future. With the development of biodiesel, the by-product glycerol will surplus. So it is environmentally friendly and cost saving to convert the glycerol to high-valued chemical materials like 1, 3-propanediol and 1, 2-propanediol. Supported Pt-Re/WO₃/ZrO₂ catalysts were synthesized for the selective hydrogenolysis of glycerol to propanediols. The effects of Re doping on the catalytic performance of Pt/WO₃/ZrO₂ catalysts were investigated. Experimental results indicate that appropriate amount of Re additives significantly increase the glycerol conversion to more than 99% and 1,3-propanediol and 1,2-propanediol yield still increase compare to Pt/WO₃/ZrO₂ catalysts while reducing the content of Pt from 2 wt.% to 1.5 wt.%. NH₃-TPD results show that the adsorbing capacities of NH₃ on the catalyst surface increase with the introduction of Re. Temperature-programmed desorption of chemisorbed CO results indicates that Re greatly improve the dispersion of Pt on the catalysts surface. So we draw the conclusion that Re improves the dehydration activity of glycerol and enhances the hydrogenation activity of dehydration-rearrangement product.