

Hydrogen Production from Steam Reforming of Glycerol over Ni based Catalysts

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Steam reforming (SR) of glycerol for the production of hydrogen was investigated over the Ni based catalysts. The Ni based catalysts were prepared by a solid phase crystallization method, and characterized by N₂ physisorption, CO chemisorption, TPR, XRD, SEM, and TEM techniques. The SR of glycerol was carried out in a temperature range of 600~800°C, an atmospheric pressure, a space velocity of 5,000~15,000 h⁻¹ and feed molar ratio of H₂O/C=1.3~3.0. It was found that the Ni/ γ -Al₂O₃ catalyst showed higher conversion and H₂ selectivity than the other catalysts. There is no formation of NiC during the reaction. However, it was slowly deactivated due to the carbon formation on the surface of catalyst and the sintering. The results suggest that the modified Ni based catalyst with the restriction of carbon formation is needed for the SR of glycerol.