

Aqueous Phase Reforming of Glycerol over Nickel Dispersed on Perovskite catalysts

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Glycerol is a main by-product produced in the process of biodiesel production. It is an important industrial feedstock for applications in food, cosmetics, pharmaceutical and other industries. Recently, many researches for converting glycerol to hydrogen or valuable chemicals have been reported.

A series of nickel based catalysts have been prepared by dispersing nickel on the LaAlO₃ perovskite prepared by a sol gel method. The catalysts were characterized by N₂ physisorption, CO chemisorption, XRD, TPR, and SEM techniques. These catalysts were evaluated for the aqueous phase reforming (APR) of 10 % glycerol solution at 225 °C and 23 bar. It was found that the glycerol conversion and hydrogen selectivity increased as the nickel loading was increased from 10 to 25%. Activity tests over the 25% nickel LaAlO₃ catalyst for 20 h. showed no decrease in glycerol conversion or hydrogen selectivity demonstrating the potential of this non-noble metal based catalyst for the efficient production of hydrogen from glycerol.