

Hydrocarbon Steam Reforming for Hydrogen Production Using Pt_x@NiMn₂O₄@Al₂O₃ Catalyst

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As the consumption of fossil fuels increases rapidly, the seriousness of environmental issues such as global warming and the possibility of depletion of fossil fuels is increasing day by day. Accordingly, renewable energy is drawing attention to solve energy and environmental issues. Among them, hydrogen energy becomes a clean and sustainable energy source because it becomes water after reaction with oxygen, and it has high interest as alternative energy because it has high calorific value. In this study, based on these advantages, we synthesize catalyst using Ni which can transfer oxygen to carbon well, and Mn which can transfer oxygen to nickel. And this catalysts were synthesized in a stable spinel structure at high temperature. We wanted to increase the activity of the reforming reaction. Pt was loaded on the surface at 0.01, 0.025, 0.05, 0.075 and 0.1 wt%.

The performance of the catalyst was raised from 300 to 600 degrees to find the optimum temperature, and then the reaction was performed under GHSV 15000 conditions for 10 hours at the optimum temperature to confirm the product through GC. Catalysts were checked for physical properties using XRD, TPR, and BET.