

Performance of Ni/LaAlO₃ on Steam Reforming of Propane

하씨니, 한종희*, 남석우, 윤성필, 임태훈
Korea Institute of Science and Technology
(jhan@kist.re.kr*)

One of the main issues associated with catalytic reforming of hydrocarbons is that the catalysts are deactivated due to the formation of carbon deposits. Among the perovskite supports, it has been proved in the literature that the lattice oxygen in LaAlO₃ effectively promotes the reaction of CH_x fragments adsorbed on metallic nickel with steam.

Steam reforming of propane (SRP) was tested over Ni/LaAlO₃ catalysts with different Ni loadings (5, 10, 15, and 20 wt. %) to investigate the effect of metal loadings on catalyst performance. Reaction temperature, steam to carbon (S/C) ratio, and residence time were taken as the reaction parameters. Effect of temperature was performed at 3 different temperatures (800°C, 700°C and 600°C). The experimental results confirmed that all the catalysts showed 100% C₃H₈ conversion at 800°C. Both 10 and 15 wt% Ni/LaAlO₃ showed C₃H₈ conversion of 100% at 700°C at S/C ratio of 3 but there was carbon formation on the surface of 15 wt% Ni/LaAlO₃ at this temperature. There was severe amount of carbon formation on the catalysts at 600°C. Results of various other experiments will be provided later.