



Effect of support on Ni catalyst used for ethanol steam reforming reaction.

Sirintra Arayawate, Pumiwat Vacharapong, Parichat Songkrasin, Phattanan Sirinimnuankul,
Pakin Viphustien and Pisanu Toochinda*

*School of Bio-Chemical Engineering and Technology, Sirindhorn International Institute of
Technology, Thammasat University*

P.O. Box 22, Pathumthani, Thailand 12121 Tel: +66-2-986-9009 ext 2309

*E-mail: pisanu@siit.tu.ac.th

Active Nickel based catalyst over various supports for hydrogen production from ethanol steam reforming (ESR) with low coke formation were investigated. The supports, Al_2O_3 , CeO_2 , CeO_2 doped Al_2O_3 ($\text{CeO}_2\text{-Al}_2\text{O}_3$) and Gd_2O_3 doped CeO_2 ($\text{Gd}_2\text{O}_3\text{-CeO}_2$) were used as support for Ni catalyst to improve coke prevention and catalytic activity. The hydrogen productions were analyzed by gas chromatography (GC) and catalysts were characterized by CHN analyser to identify the amount of coke before and after used. The result shows that the doping of Ce in Al_2O_3 and Gd in CeO_2 can improve the catalyst performance of ESR. $\text{Ni/Gd}_2\text{O}_3\text{-CeO}_2$ exhibits the highest hydrogen yield with the lowest coke formation. The roles of Ce and Gd in the supports will be discussed.

Keywords: Catalyst; Support effect; Doped support