

Autothermal reforming of propane over Ni catalysts promoted by alkali metals

박선영, 신재순¹, 김영철¹, 김종호¹, 문동주², 박남국^{1,*}
전남대학교; ¹전남대학교 응용화학공학부; ²KIST
(ncpark@chonnam.ac.kr*)

Promoted Ni based hydrotalcite catalysts by alkali metal were investigated for the autothermal reforming(ATR) of propane in a fixed-bed flow reactor. Reactions were carried out with the stream ratio of H₂O/C/O₂=3/1/0.73 in the temperature range from 300 to 700 °C. Alkali metals were doped in the preparation of hydrotalcite catalysts, and XRD, TGA and TEM were used to characterize them. Sintering of the Ni particles was observed to be reduced much by the addition of alkali metal promoters. This result in the reduced coke formation for the promoted Ni hydrotalcite catalysts compared with the un-promoted ones. Even the addition of a small quantity of an alkali metal showed increased dispersion of Ni particles. Thus, alkali metal promoters are believed to reduce both the carbon deposition rate and the particle size. Cerium was the best among the tested alkali metals.