Nickel based Mesoporous Alumina over Steam CO$_2$ Reforming of Methane

_____[1,2],   [1,3],   [1], Ramesh.R[1],   [1],
                              [1],   [1,2,*]
[1]   ; [2]UST; [3]
(djmoon@kist.re.kr[*])

Steam CO2 reforming of methane (SCR) is a promising way to produce synthesis gas which can be a feedstock for GTL-FPSO process. Mesoporous alumina with high surface area and narrow pore size distribution was prepared used as catalytic support. Ni supported catalyst were prepared by EISA method. The prepared catalysts were characterized by various techniques such as N2 physisorption, CO chemisorption, TPR, XRD, SEM, TEM-EDS and TG analysis. Commercial simulation package was used to estimate optimum experimental conditions for SCR of methane. The simulation results were compared with the experimental results under the tested conditions.

It was found that Ni was well dispersed on alumina lattice and showed smaller nickel particle sizes Therefore, it showed higher catalytic performance and less sintering of active metal in the SCR of CH4 at the reaction conditions of 800~ 900 , 21 bar and molar ratio of CH4:CO2:H2O = 1 : 0.7 : 1.55.