

Fisher Tropsch Synthesis Reaction over Metal promoted Iron-based Catalysts Supported on γ -Alumina

Nasim Ghaffari Saeidabad^{1,2}, Ali Alizadeh Eslami^{1,2}, 송현태^{1,2}, 김현동^{1,3}, 노영수^{1,4}, Ali Fazeli^{5,1}, 문동주^{1,2,†}

¹한국과학기술연구원; ²KIST School; ³고려대학교; ⁴KIST School, UST; ⁵University of Tehran (djmoon@kist.re.kr[†])

The iron-based catalysts in fisher tropsh synthesis are capable to carrying out both water-gas shift and FTS reactions. Conventional iron-based catalysts contain small amounts of potassium in order to improve the carburization and suppress methane formation. Metal promoters such as Mn, Ca, Zn, Cu, and Mg have been investigated to enhance catalytic activity and selectivity.

In this research, Fe based catalyst supported on alumina (FeKIST1), (FeKIST2) and FeKIST3 were prepared by an impregnation method, and characterized by different methods including X-ray diffraction (XRD), Temperature Programmed Reduction (TPR), and N₂ physisorption. The catalytic performance for FTS was evaluated in a fixed bed reactor system with the H₂/CO ratio of 2:1, T = 280 °C, and P = 20 bar. It was found out that the FeKIST2 catalyst shows higher CO conversion, C₅₊ selectivity and suppress the CH₄ selectivity.