

Studies on CO₂ utilization over Cobalt Based FTS hybrid catalyst for Application in GTL-FPSO process김현동^{1,2}, 송현태^{1,3}, 박홍란¹, 양유정^{1,2}, 홍태호¹, 이관영², 문동주^{1,2,†}¹한국과학기술연구원; ²고려대학교; ³KIST School (UST)(djmoon@kist.re.kr[†])

The Gas to Liquid (GTL) process is one of the most promising technologies for eco-friendly fuel production. In the GTL process, Fischer-Tropsch synthesis (FTS) reaction is known as a key catalytic process that converts synthesis gas (CO + H₂) to value-added hydrocarbon products. The CO₂ utilization in FTS process takes the possibility to reduce the greenhouse gases and utilizes the captured CO₂ in an economic and environmentally-friendly way. In this study, the zeolite was synthesized by a conventional hydrothermal method, and Co/ γ -Al₂O₃ catalyst was prepared by an impregnation method. The cobalt based hybrid FTS catalyst was prepared by physically mixing Co/ γ -Al₂O₃ with zeolite. The effect of CO₂ ratio in syngas was investigated on conversion and selectivity. The physiochemical properties of all prepared catalysts were characterized by XRD, BET and NH₃-TPD techniques. The catalytic performance of the physically mixed bi-functional hybrid catalyst was evaluated under a fixed bed reactor. The products were analyzed by on-line and off-line GCs. The catalytic performance over the bi-functional hybrid FTS catalysts was compared with Co/ γ -Al₂O₃ catalyst.