

Studies on the development of Cu based Catalyst for the Synthesis of Higher Alcohol in the Mild Operation Conditions

송현태^{1,2}, 노영수^{1,3}, 홍기훈^{1,2}, 신철아^{1,3}, 문동주^{1,2,†}

¹한국과학기술연구원; ²UST; ³고려대학교

(djmoon@kist.re.kr[†])

Abstract

Higher alcohols (HA) has been considered as potential fuel additives for solving the problems of fuel additives like MTBE (Methyl tert-butyl ether). Based on the previous work, it was suggested that Cu-Zn-Al based catalysts may be applied in the processes for the production of higher alcohol.

A variety of Cu-based catalysts were prepared via co-precipitation method using different metals. The catalysts were characterized by a series of N₂ adsorption, XRD, TPR, TPD NH₃, TGDTA, SEM and TEM. The reaction for higher alcohols synthesis was carried out at 240 °C, 35 bar, GHSV = 3000 h⁻¹ and H₂/CO = 2 under fixed bed reactor system. The yield of higher alcohol and the conversion of CO were investigated and compared with the results of co-feeding of CO₂ in the higher alcohol synthesis. It was found that Cu-Co catalyst shows higher conversion and selectivity towards higher alcohols than the other catalysts. It was also found that CO₂ co-feeding to syngas enhances the conversion and selectivity.