Selective Hydrogenolysis of Glycerol to 1,2-Propanediol over Hydrotalcite based Catalyst

이상용[1], 문동주[1,*], 김승훈[1,2], 정재선[1,3], 이승환[4]
[1]KIST; [2]Korea University; [3]UST; [4]J&K Heaters
(djmoon@kist.re.kr*)

Recently, the production of glycerol has been increased with the production of biodiesel as a clean fuel. One of the most attractive approaches of converting glycerol is to produce propanediol(1,2- or 1,3-PDO) by selective hydrogenolysis of glycerol.
The hydrotalcite based catalysts were prepared by precipitation method and characterized by N2 physisorption, CO chemisorption, XRD, SEM, TPR and TPD. The catalytic hydrogenation of glycerol to 1,2-PDO was investigated at 463 K, 25 bar of initial H2 pressure and 20 wt% glycerol aqueous solution for 15 h in fixed bed reactor. It was found that the Cu/MgAl catalyst with glycerol conversion of 70 % and 1.2-PDO selectivity of 90 % showed good catalytic performance.
The results show that the structure and acid-base properties of hydrotalcite provides comparatively high hydrogenolysis activity of dehydration and hydrogenation than other catalysts.
Keywords : Glycerol, Propanediol, Hydrogenolysis, hydrotalcite based catalyst