Preparation of $V_aZr_bO_x$ and its catalytic performance for propane dehydrogenation

최형주, 전남기, 윤용주[†]
포항공과대학교
(yjyun@postech.ac.kr[†])

ZrO_x-based metal oxides have attracted attention as alternative catalysts for non-oxidative propane dehydrogenation due to their high selectivity towards propylene. Coordinatively unsaturated Zr sites, created by oxygen removal from the metal oxides, are considered as the active sites for propane dehydrogenation. Addition of dopants and reduction by H_2 could create oxygen vacancies and therefore, enhance the activity of the catalyst. In this study, we prepared $V_aZr_bO_x$ catalysts by using different vanadium precursors and controlling pH of precipitation solution. Moreover, we investigated the influences of H_2-cofeeding and a noble metal dopant on catalytic performance of the catalysts to understand the impact of the reduction of the catalysts. The catalysts were characterized by N_2-physisorption, ICP, NH_3-TPD, TPR, XRD, TGA, FT-IR. Optimized $V_aZr_bO_x$ catalyst shows two times greater propylene yield than bulk zirconia.