Dehydration of glycerin to acrolein over heteropolyacid catalyst supported on mesoporous titania

강태훈, 김도희†
서울대학교
(dohkim@snu.ac.kr†)

Biomass has attracted much attention as a clean energy resource with increasing concern about fossil fuel depletion and global warming. Therefore, a number of researches have been focused on the conversion of low-cost glycerin feedstock to value-added chemicals. Among the catalytic processes for glycerin conversion, gas-phase dehydration of glycerin has garnered recent attention due to its applicability for the synthesis of acrylic acid, methionine, and super-absorber polymers. Heteropolyacids (HPAs) are early transition metal-oxygen anion clusters that possess much stronger Brønsted acid strength than any other conventional catalysts. However, low surface area (< 10 m2/g) of HPAs is a main drawback to maintain the catalytic performance during long time reaction. In this work, gas-phase dehydration of glycerin to acrolein was carried out over heteropolyacid catalyst supported on mesoporous titania. The prepared catalysts were characterized by FT-IR, XRD, and nitrogen adsorption-desorption analyses. Pyridine-adsorbed in-situ FT-IR spectroscopy analyses were conducted to examine the acid properties of the catalysts.