Catalytic Dehydrofluorination of 1,1,1,2,3-Pentafluoropropane (HFC-245eb) to 2,3,3,3-Tetrafluoropropene (HFO-1234yf) using a Chromium Oxyfluoride Catalyst

임서연, 송광호[1], 김홍곤, 안병성, 하정명†
한국과학기술연구원; [1]고려대학교
(jmha@kist.re.kr†)

Recently, 2,3,3,3-Tetrafluoropropene (HFO-1234yf) having zero ozone depletion potential (ODP), low global warming potential (GWP) and high energy efficiency attracted global attention as a favorable alternative to 1,1,1,2-tetrafluoroethane (HFC-134a). We studied the dehydrofluorination of 1,1,1,2,3-pentafluoropropane (HFC-245eb) to HFO-1234yf. Although the dehydrofluorination is an indispensable pathway for the formation of hydrofluoroolefins and haloalkenes which are important starting materials for halogen-containing polymers including PVC, PVdC, PVDF and PTFE, the researches were insufficient and the origin of catalytic activity has not been clear. We investigated the importance of surfce modification for the high catalytic activity using the surface-modified chromium oxide catalysts prepared by modified sol-gel method. During the reaction, the surface of chromium oxide catalysts became oxyfluoride phases which are catalytically active. To elucidate the origin of catalytic activity, the catalysts were characterized by XPS, XRD, N_2-physisorption, elemental analysis and TG.