CO oxidation over tin oxide surfaces enhanced by platinum doping

배준민, 이현주†
한국과학기술원
(azhyun@kaist.ac.kr†)

Doping precious metal atoms into host metal oxide lattice can enhance catalytic activity by changing the property of surface lattice oxygen. Here, a Pt-doped antimony-tin oxide (Pt/Sb-SnO_2) for CO and C_3H_6 oxidation was synthesized. Pt-deposited tin oxide (Pt/SnO_2) and silica (Pt/SiO_2) were also prepared for comparison. HAADF-STEM images, DRIFT for CO chemisorption, H_2-uptakes, and XPS results showed that the Pt/Sb-SnO_2 has atomically doped Pt inside the tin oxide surface. The Pt/Sb-SnO2 showed the highest activity for CO oxidation but the poorest activity for C_3H_6 oxidation. CO-TPR and O_2-TPD results showed that doping Pt atoms into the tin oxide lattice leads to a better surface lattice oxygen activity, resulting in enhanced catalytic performance. In-situ DRIFT for CO oxidation showed less formation of carbonates on the surface of the Pt/Sb-SnO_2, resulting in enhanced CO oxidation activity and durability.