

A study on Ru-added Pt/TiO₂ catalysts for water gas shift reaction

황경란*, 조성호, 박종수, 이진석, 임선기¹
한국에너지기술연구원; ¹한국과학기술원
(hkran@kier.re.kr*)

Recently, the considerable interest for the water gas shift(WGS) reaction has grown due to its potential use in fuel processors for fuel cells. In order to develop a compact reactor for mobile and automotive applications, one needs to reduce WGS reactor size occupying above 30% of total fuel processor volume. For this, it is essential to improve the activity and kinetic rate of catalyst in WGS reaction at lower temperature than 350 °C. In this work, a series of Pt-Ru catalysts prepared by incipient wetness impregnation method for water-gas shift reaction were studied. The activity of Pt[1.5]-Ru[0.5]/TiO₂ catalyst was higher than that of Pt[2]/TiO₂ catalyst at below 300 °C although Pt content was lowered. From the results of In-site DRIFT spectroscopy, It could be carefully concluded that this enhancement of activity was occurred due to different type of CO adsorption on Pt affected by Ru, which are represented at 2009 cm⁻¹ (in the region of 2040-2010 cm⁻¹) observed on only Ru-added catalyst.