

Electro-oxidation of Glycerol using Porous Carbon supported PtCu catalyst

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As global warming has intensified, the demand for sustainable energy has emerged. Glycerol, which has three alcohol groups attached to each carbon, is being produced rapidly since it is a main byproduct of biodiesel production. Many recent studies have focused on the electro-oxidation of glycerol because of its high faradaic efficiency and valuable products.

In this study, platinum and copper alloy catalyst was used for glycerol electro-oxidation. Porous carbon (PC) was used as support and the atomic ratio of Pt to Cu was tuned to obtain high electrical surface area and to modify the electronic structure of Platinum in enhanced catalytic mass activity. The electrochemical active surface area was measured through cyclic voltammetry, CO stripping and stability tests were also carried out. Calculation based on the density functional theory (DFT) was performed to figure out hydroxide binding energy on PtCu surface and X-ray photoelectron spectroscopy (XPS) analyses were conducted to elucidate the electronic structural changes.