Powering Fuel Cells with Biomass-drived Ethylene Glycol and Glycerol over PtRu-based Electrocatalysts

김형주, 최승목, 서민호, Sara Green[1],
Geoffrey A. Tompsett[1], George W. Huber[1], 김원배*
광주과학기술원; [1]University of Massachusetts
(wbkim@gist.ac.kr*)

Recently, biomass-derived oxygenated hydrocarbons, such as ethanol, propanol and ethylene glycol have been demonstrated as potential fuels in the DMFC-like fuel cells, since such biomass-derived molecules are renewable and CO_2 neutral. Ethylene glycol and glycerol, which can be produced from biomass, would be promising because they are less toxic and inflammable, and also possess relatively high theoretical energy density. In this study, we investigate the structural, electronic and electrochemical features of carbon-supported ternary PtRuSn (PtRuSn/C) and graphene-supported PtRu (PtRu/G) catalysts for the electrooxidation of ethylene glycol and glycerol. The PtRuSn/C and PtRu/G catalysts are characterized by various physicochemical analyses such as XRD, TEM, EDS, TGA, XPS and XANES. This work was supported by the New & Renewable Energy of the Korea Institute of Energy Technology Evaluation and Planning (KETEP) grant funded by the Korea government Ministry of Knowledge Economy (No. 20093020030020-11-1-000 and No. 20103020030020-11-2-200)