Efficient electrooxidation of methanol and ethanol using MoOx-decorated Pd catalysts in alkaline media

임은자, 김원배*
광주과학기술원
(wbkim@gist.ac.kr*)

Methanol and ethanol may be used as portable clean sources of liquid fuels in AEM fuel cells. Pd-based catalysts are promising candidate catalysts for the efficient electrooxidation of alcohol. Effective approach has involved the addition of oxide materials to a Pd catalyst to a Pd catalyst to improve the oxidation of small alcohols in alkaline media. Metal oxide can easily form hydroxyl species (OH−) on such metal oxide surfaces and can help the oxidation of adsorbed CO or intermediate species on a catalyst surface. In this study, we study the preparation of a MoOx-decorated Pd catalyst supported on carbon for the electrooxidation of small alcohols in alkaline media. We compared the electrocatalytic activities of two catalyst materials upon modification with MoOx: Pd nanoparticle-deposited MoOx/C and MoOx-deposited Pd/C. Among the materials, the Pd-MO/C catalyst demonstrated a much higher mass activity toward methanol or ethanol electrooxidation in alkaline media. This work was supported by the KETEP (no.20103020030020-11-2-200) and the Global Frontier R&D Program (no.0420-20110157).