

메조크기의 다공성 탄소에 담지된 고담지 합금 촉매에 대한 연구

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Investigation on PtRu alloy catalysts with meso-porous carbons for DMFC

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Abstract : Lately many efforts have been devoted to develop the optimum supporting materials for Direct Methanol Fuel Cells. The supporting material is known for one of the factors of improvement on catalytic activity.

Especially, highly dispersed nanoparticles on supporting material cause improvement of performance. Vulcan XC-72 is commonly used for supporting materials. The goal of this study is enhancement of performance with catalysts on new supporting material, meso-porous carbon, carbon aero gel, etc. instead of Vulcan XC-72.

Meso-porous carbon makes reactant and product come in and go out, respectively and has larger surface area than any other carbon structure.

Meso cellular foam carbon (MCF-C), Carbon aerogel (CA) etc. have been synthesized and characterized. PtRu catalysts on MCF-C and CA have been prepared.

Carbon aerogel is very useful supporting material for DMFC. PtRu catalysts dispersed uniformly on carbon aerogel were observed by TEM. We investigated methanol oxidation activities of the catalysts with cyclic voltammetry (CV), alloy extent of the catalysts with X-ray diffraction (XRD) and morphological characteristics of the membrane-electrode assemblies (MEAs) with scanning electron microscopy (SEM). For the comparison of electrocatalytic activity, cyclic voltammetry and single cell test were carried out. The PtRu catalyst on carbon aerogel shows better performance than that on other supports.

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