

Photosynthesis Hybrid Bimetallic/MWCNTs Electrocatalysts for Direct Formic Acid Fuel Cells

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Abstract

To promote the performances of DFAFCs, nano palladium and bimetallic copper-palladium catalysts were applied as anodic catalyst for formic acid oxidation. In our previous study, Pd/MWCNTs catalyst has good current density of formic acid oxidation, because of the well dispersion and nanoparticle size caused larger surface area. This study photosynthesized Pd and Cu-Pd catalysts on the MWCNTs surface to form Pd/MWCNTs and Cu-Pd/MWCNTs hybrid electrocatalysts by synchrotron radiation. The structure and surface morphology of the hybrid materials were analyzed by XRD and SEM. The results of XRD analysis indicated bimetallic copper and palladium form a solid solution structure.

Cyclic voltammetry is used to evaluate the electrocatalytic performances of hybrid Pd or Cu-Pd/MWCNTs materials. The current responses of formic acid oxidative reaction of Cu-Pd/MWCNTs was higher than that of Pd/MWCNTs. The results showed the electrocatalytic performance were enhanced by bimetallic effects in hybrid Pd based/MWCNTs materials.