

Synthesis and Characterization of Pd/ZrO₂/AO-MWCNTs for Direct Formic Acid Fuel Cells

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For the increasing awareness of environmental protection, sustainable energy has become our goal. After the fuel cell reacts, only water and heat are generated, and the pollution is less than other batteries, which can be regarded as a kind of green energy.

Direct formic acid fuel cell (DFAFC) is one type of proton exchange membrane fuel cells. Formic acid is the fuel for its non-toxic, non-flammable and other advantages. Palladium is usually the catalyst to oxidize formic acid in the anode. This study investigated anodic catalysts with conductive multi-walled carbon nanotubes as catalyst supports with zirconium oxide modification. The palladium catalyst was reduced on the prepared support by synchrotron radiation X-ray photo-synthesis method.

The basic properties and composition of the prepared samples were analysed by Raman, FT-IR, TGA, XRD and ICP-OES. The morphology was observed by FE-SEM and TEM. Finally, the electrochemical reaction and stability of the catalyst were detected by CV, ECSA and CO stripping.

Keywords: DFAFC, electrocatalyst, carbon nanotube, palladium, zirconia