عنوان مقاله:

Investigating the Timing Effect of the Nafion Addition to the Bimetallic (Pd-Pt) Catalyst in Proton-Exchange Membrane Fuel Cell Cathode

محل انتشار:

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نویسنده:

Masoumeh Javaheri - *Ceramic department, Materials and Energy Research Center, Karaj, Iran*

خلاصه مقاله:

In this research, bimetallic catalysts including Pd and Pt was synthesized on the composite of carbon nanotube (CNT) with Nafion and compared with Pd-Pt synthesized on CNT considering the key role of catalysts in PEMFC electrodes. The difference between the electrodes fabricated from these two synthesized catalysts was in the adding time of Nafion. The synthesized catalyst can enhance the performance of gas diffusion electrode (GDE) in cathode reaction (Oxygen Reduction Reaction or ORR) of polymer electrolyte membrane fuel cell (PEMFC) compared to commercial Pt/C catalyst. The bimetallic catalyst was synthesized in two steps. Pd and Pt were reduced at the first and second step, respectively. To reduce metals on support, the impregnation method were used along with hydrothermal. The electrochemical performance of the electrodes in ORR was studied through the Linear Sweep Voltammetry (LSV), Cyclic Voltammetry (CV), and Electrochemical Impedance Spectroscopy (EIS). Inductively coupled plasma (ICP), X-ray Diffraction (XRD), and Transmission Electron Microscopy (TEM) techniques were applied to characterize the catalyst. The results have confirmed that the timing of Nafion addition can influence the electrode performance for ORR.

کلمات کلیدی:

CNT, Composite, Nafion, ORR, PEMFC