

SYNTHESIS AND PERFORMANCE OF Pt/ e-CNF AND Pt/NITROGEN DOPED e-CNF ELECTROCATALYST IN PEMFC

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ABSTRACT

Electrospun carbon nanofiber (e-CNF) and nitrogen doped electro spun carbon nano fibers (N-e-CNF) have been synthesized by electrospinning technique and platinum supported e-CNF and Pt/ N-e-CNF have been prepared by chemical reduction method. The synthesized electrocatalysts have been characterized by powder X-ray diffraction (XRD), Raman spectroscopy, scanning electron microscopy (SEM) and cyclic voltammetry (CV) studies. The anode and cathode electrodes of polymer electrolyte membrane fuel cell have been fabricated using Pt/e-CNF and Pt/N-e-CNF electrocatalysts. The Nafion 117 membrane is used to prepare the MEA. The performances of PEMFC with the prepared MEAs using Nafion 117 have been studied with two synthesized electrocatalysts (Pt/e-CNF and Pt/ N-e-CNF) and then compared with commercially available Pt/C catalyst under similar conditions. The operating conditions for the best utilization and performance of the prepared catalysts have been determined for the single fuel cell system (5cm x 5cm area).

Keywords: Electrospinning, Nitrogen doped CNF, Electrocatalysts, Cyclic voltammetry

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