

Nafion/Polypyrrole/Pt Composite Membrane for Fuel Cells: A Facile Route to Incorporate Conducting Polymer/Inorganic Metal into Ionic Conducting Polymer and Its Characterization

박호석, 김여진¹, 임현숙, 홍원희*
한국과학기술원; LG 기술연구원
(whhong@kaist.ac.kr*)

We modified Nafion by means of chemical in-situ polymerization of Pt-anchored pyrrole monomers for fuel cell membrane. After Pt-anchored pyrrole monomers were in-situ polymerized in Nafion matrix, nanoparticles of ca. 40-80 nm were dispersed. XPS and FT-IR was used to characterize the modified membranes, demonstrating that positively pyrrole monomers played a role of linking Nafion with Pt precursor via mutual interaction. The polymerization site of pt anchored pyrrole monomer was controlled via mutual interaction by controlling concentration of pyrrole monomer, resulting in good physical and transport properties for fuel cells. Thermal stability, proton conductivity, methanol permeability, and cell performance were analyzed for application in fuel cells. The physical and transport properties of Nafion were influenced by the changes in the morphology at surface via mutual interaction between incorporated nanoparticles and Nafion matrix.