

## Preparation of Pt/Nafion self-humidifying membranes for PEMFC (Polymer Electrolyte Membrane Fuel Cell) via supercritical-impregnation methods

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Pt/Nafion self-humidifying membranes for Polymer Electrolyte Membrane Fuel Cell (PEMFC) were synthesized via supercritical-impregnation methods. The Nafion 112 membranes were impregnated with Pt(II)(acetylacetonate) from a supercritical carbon dioxide (scCO<sub>2</sub>) solution at 80°C and 30 MPa. After the impregnation, the pressure decreased slowly by releasing CO<sub>2</sub>. And the Pt-impregnated Nafion membrane was converted Pt deposited Nafion membrane by reducing agent, sodium borohydride (NaBH<sub>4</sub>) with various concentrations under 50°C and 2 hours.

The prepared Pt-impregnated Nafion (Pt/Nafion) composite membrane were investigated by Electron Probe Micro analysis (EPMA) which showed distribution of Pt particle and Scanning Electron Microscopy (SEM) and Atomic Force Microscopy (AFM). which revealed morphology of surface of Pt/Nafion composite membrane.