

Symp A7

DMFC에서 메탄올 Crossover 방지를 위한 전극 및 전해질 설계
Design of Electrodes and Membrane for Methanol Tolerance in
Direct Methanol Fuel Cell (DMFC)

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Nanosized electrocatalysts were synthesized for use in enhancing the stability of methanol crossover and electrocatalytic activity for oxygen reduction in direct methanol fuel cells. Due to the methanol tolerance of nanosized cathode electrocatalysts, the galvanostatic endurance of the electrocatalysts at a constant operation current was superior to that of Pt. The nanosized electrocatalysts showed a higher methanol tolerance and more stable power density than pure Pt. In addition to the methanol tolerant cathode electrocatalysts, modified Nafion polymer membrane was used to enhance DMFC performance by preventing or reducing methanol crossover through the electrolyte. Interestingly, the Pd-impregnated nanocomposite membrane showed a lower permeability for methanol and maintained a proton conductivity comparable to that of a pure Nafion membrane. Because of the modification of the membrane by the Pd nanophases, a high molar concentration of methanol could be applied for use in practical DMFC without any power loss.