

Methanol and Water Cross-over in Hybrid Polymer
Electrolyte and in DMFC Stack

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As early demonstrated [1], fuel crossover in direct methanol fuel cell cause the considerable reduction of cell performance. Electro catalysts, which are used for methanol oxidation, have not been developed satisfying performance. Therefore, to reduce the crossover is the one of the important factor for improving fuel cell performance and fuel efficiency. To approach minimize or eliminate the fuel crossover, various researches have tried. Methanol impermeable composite electrolyte system [2], acid-doped polymer electrolyte [3,4], or new compositional polymer electrolyte [5] have been tried for DMFC. In this work hybrid polymer electrolyte was applied in DMFC 100W stack [6].

Hybrid membrane based on Nafion was fabricated by micro-emulsion method. Ionic conductivity and methanol crossover results have been developed for application in DMFC [6]. In this work hybrid membrane was assembled with electrodes and applied to DMFC stack. Under the operation of DMFC stack, crossover of methanol solutions, anodic fuel, have been studied with current of DMFC stack. Water, which are produced by electrochemical reaction, have also been studied. Adequate supplements of fuel have been studied to reduce methanol crossover in DMFC and to increase fuel cell efficiency.

References.

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