

Development of selective oxygen reduction catalysts for direct methanol fuel cells (DMFCs)

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DMFCs are attractive electrochemical devices for portable applications. However, DMFCs have a serious technical problems, i.e. methanol crossover from the anode to the cathode through the polymer electrolyte membranes. It has been shown that methanol crossover not only lowers fuel utilization but also causes the cathode performance losses due to the formation of "mixed potentials".

In this study, we synthesized a novel platinum-based electrocatalysts for methanol tolerance. The activity of oxygen reduction reaction in presence of methanol was evaluated by rotating ring disk electrode(RRDE). The size and morphology of the catalysts were determined using transmission electron microscopy (TEM). The analysis of the electronic structure on the electrocatalyst surface was carried on by X-ray photoelectron spectra (XPS).