

The role of Au in nanostructured electrode for direct methanol fuel cell

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PtAu alloy nanoparticle catalyst for methanol electrooxidation was synthesized by a borohydride reduction method combined with freeze-drying and their electrochemical characteristics with respect to methanol oxidation were investigated. In order to clarify the role of Au in the electrooxidation of methanol using PtAu alloy nanoparticle, their catalytic activities were also investigated assuming formaldehyde and formic acid are produced as reaction intermediates. The origin of the enhanced catalytic activity of the PtAu catalysts is discussed from the standpoint of a modified methanol oxidation pathway. Further, based on the role of Au in methanol oxidation, we propose that PtAu is a promising material for use as the anode catalyst in direct liquid feed fuel cell.