Preparation of Ionic Liquids Modified Cathode Catalysts for PEMFC

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Proton exchange membrane fuel cells (PEMFCs) can efficiently convert hydrogen energy into electrical energy for easy use. The high cost of imported Pt/C catalysts used in the fuel cell restricts the large-scale commercialization of PEMFCs in China. Protic ionic liquids have the advantages of high solubility of O2 and proton conductivity, which can be used to modify catalysts. In this paper, I propose to modify domestic commercial Pt/C catalysts with ionic liquids. After comparing the modification effect of different ionic liquids under different conditions, the half-wave potential of modified domestic catalyst was 0.843 V (vs. RHE) in 0.1M HClO4 solution, which increased 34 mV (vs. RHE) compared with the imported catalyst; the limiting current density reached 5.87 mA/ cm2, which is 0.16 mA/ cm2 higher than the imported catalyst. And the cost is much lower than that of imported catalyst, having great commercial application prospect. By means of scanning electron microscopy (SEM) analysis of the micro-morphology of the modified catalyst, some potential factors affecting the property of the catalyst were proposed, which provided a reference for the further study of catalysts for PEMFCs.

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