

Preparation of the Sulfonated Carbon Materials and Their Application for the Proton Exchange Membranes

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PEMFCs have attracted much attention due to their high power density, high efficiency, low emission and very quiet for various application such as vehicles, electronic device and residential power generation. However, there are still several problems for their commercialization such as high cost, fuel availability and storage, and durability. M. Hara et al. reported the carbon samples having high density of sulfonic acid group were prepared by incomplete carbonization. Those are insoluble in organic solvents and act as proton conductors because those excel in proton conductivity and thermal stability and can be produced at low cost. In this study, we prepared the sulfonated carbon materials having a large ion exchange capacity by using polycondensation reaction of resorcinol and formaldehyde and the natures of sulfonated carbon materials which are prepared at different carbonization temperature were investigated. Those are higher water uptake abilities than nafion membranes and mainly consisted of the sulfonated carbon materials by SEM and EDX analyses. These sulfonated carbon membranes are used as proton exchange membranes for PEMFCs.