

Pore Characterization of Gas Diffusion Layer in a PEFC

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Characteristics of GDL(gas diffusion layer) largely determines the gas diffusion and water removal in and from a cell, thereby changing performance of a PEFC. To optimize the water management, the in-depth understanding of GDL structure is required. In an actual cell, the cell is clamped at a certain pressure and the rib of flow field plates compresses the GDL. The pore structure is changed by compression, resulting in different porosity and pore size distribution of the GDL. In addition, hydrophobic characteristics of GDL beneath the rib of the flow field plate may be changed due to the broken bonds of carbon fibers and PTFE coating fibers with. In this work, changes in pore size distribution and hydrophobicity were studied for the GDLs compressed by flow field plate. Mercury porosimeter and PMI porometer were utilized to investigate changes in macro-size pore distribution and BET system was used for micro pore size region. In addition wettability of the surface is investigated. This study on the pore characterization helps in explaining gas and water transport in GDL and the optimal selection of GDL.