

## Sulfonation of fluorocarbon thin films for silicon based micro fuel cell applications

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Over a long times, studies of proton exchange membrane for polymer electrolyte fuel cell have focused only on perfluorosulfonic acid membrane because they exhibited high proton conductivity and excellent thermal and mechanical properties. But fabrication technologies of thin film type proton exchange membrane need to be developed for miniaturized fuel cells. These circumstances stimulate a research in to alternative polymer electrolyte membrane using the conventional thin film semiconductor processing. In this work, we represent a new type of highly proton conductivity membrane by the conventional semiconductor process using plasma treatment and sulfonation. Experiment concerning the sulfonation of fluorocarbon membrane with oxygen plasma treatment have been carried out successfully, the resultant sulfonated electrolyte membrane show proton conductivity. The membrane was characterized by SEM, XPS, SIMS and conductivity was measured with impedance spectroscopy which is the basic requirement for fuel cell.