

Analytical Methods of Membrane Degradation in PEMFC

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The polymer electrolyte membrane (PEM) is a key material in PEM fuel cells and the lifetime of PEMFCs is mainly limited by the lifetime of the membrane. So, it is the most important to find causes of the membrane degradation. During PEMFCs operation, membrane degradation can evaluate through the performance life testing and product effluent analysis etc. But here we suggest the method for degradation evaluation of only membrane after life testing and stack disassembly. There is a just one membrane after operation, that limits the various analysis. Sometimes, it may not be necessary to perform all of these methods because the cause of the membrane failure can occur very simple. But usually membrane degradation is generated by the various factors like operating temperature, pressure and relative humidity of reactant gases, so just one method can not find the cause of membrane degradation accurately. In this study, we classified the membrane degradation cause into four and proposed the systematic method to find the causes of membrane degradation effectively and to simplify the analysis for degraded membrane. Also it will provide a baseline for more complicated tests.