

Synthesis of thermoplastic polymers with using sulfonated poly(arylene ether sulfone)

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Polymer electrolyte membrane fuel cells(PEMFCs) made several revolutionary advances in power generation system because of their environmentally friendly feature. In PEMFC system, proton exchange membrane(PEM) is one of the most important elements which have a great effect on the performance of fuel cell. Nafion, poly(perfluorinated) copolymer membrane produced by Du Pont, is the most widely used membrane in fuel cell industry due to its great proton conductivity and durability. However, high production cost and complex procedure in fabricating Nafion became one of the problems which would delay commercialization of fuel cell industry. In this manner, when sulfonation degree is well-controlled, poly(arylene ether sulfone), hydrocarbon-based polymer, can be an alternative of Nafion. In terms of mass production of membrane, however, it is quite difficult to produce poly(arylene ether sulfone) membrane from its solution form. Accordingly, simplifying the manufacturing procedure would be a key to produce PEM rather easily. In this study, we report the synthesis and properties of thermoplastic polymer by sulfochlorination of poly(arylene ether sulfone).