

Preparation of high performance Crosslinked Sulfonated copolyimide membranes with high temperature stability for Fuel Cell

김도완, 양승진, 조태수, 이춘근, 한학수*
연세대학교 화학공학과
(hshan@yonsei.ac.kr*)

Polyimides characterized by high thermal and thermo oxidative stability are expected to with stand the cruel fuel cell operating conditions. The sensitivity to hydrolysis is a handicap for polyimides and various approaches to improve the hydrolytic stability are under active research. Crosslinking is expected to render improved hydrolytic stability since crosslinked membranes can effectively resist swelling in water. Moreover crosslinking can reduce the methanolcross over which is a major problem faced in DMFC. Hence crosslinked membranes can serve better in both PEMFC and DMFC. In this study 6 membered polyimides are used since 5 membered ring polyimides are highly susceptible to hydrolysis at high temperatures. The chemical structure ofcrosslinked polyimides is analyzedby FT-IR. The thermal stability of the crosslinked polyimides are analyzed by TGA. The electrochemical properties are analyzedby Water uptake Ion exchange capacity (IEC) and Conductivity and are compared with Nafion 115.