

## A study on ionic liquid based electrodes for anhydrous and high temperature polymer electrolyte fuel cells

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Recently polymer electrolyte fuel cell technology demands operation at high temperature for higher efficiency, CO tolerance and easy water management, but conventional membranes exhibit poor proton conductivity at high temperature. The polymeric membranes were dependent on the presence of water to solvate the protons from the sulfonic acid groups. Consequently, the operational cell temperature was limited to below 100°C. Thus, to solve this problem we used the ionic liquids(ILs) as a solvating solvent in the polymer media at high temperature. ILs as a substitute of water in sulfonated polymers have shown considerable potential for high temperature electrolytes due to their unique properties such as nonvolatility, high ionic conductivity, nonflammability. In this study, we investigated the effect of the contents of Nafion ionomer and ionic liquid on improvement of activation overpotential in IL based electrodes. It was observed that cyclic voltamograms were dependent on the content of ionic liquids.