

## Sulfonated polystyrene/polyvinyl chloride composite membrane for PEMFC applications: Improvement of oxidative stability

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The sulfonated polystyrene (SPSt) / polyvinyl chloride (PVC) composite electrolyte membranes were prepared via styrene-impregnated polymerization within PVC matrix and subsequent sulfonation. The propagated polystyrene chains were interpenetrating with those of the enforcing PVC film, and hence the two components were completely compatible. The effects of some preparation parameters on the membrane performances were investigated. It was found that the type of monomer effect oxidative stability of synthesized membrane. There are two different reason for increasing stability. First, substitute group in used monomer make stetic hinderance effect that can interfere acessment of radical compound which attack polymer chain of styrene. Second, a-hydrogen in styrene polymer is most weak part. Therefore membrane stability can be increased by using substituted monomer which contain a-methyl group. In a word, it seemed that an inexpensive polymer electrolyte membrane suitable for PEMFC applications was obtained in this study.