Mohamed A Abu-Saied et al., J Fundam Renewable Energy Appl 2017, 7:6(Suppl)
DOI: 10.4172/2090-4541-C1-035

Preparation and characterization of PVC-SP(ST-co-AN) membranes for proton exchange membrane fuel cell applications

Mohamed A Abu-Saied[1], E A Soliman[1], A A El –Bardan[2], S A N Khattab[2] and **E A Ghazi[2]**
[1]Advanced Technologies and New Materials Research Institute, Egypt
[2]Alexandria University, Egypt

Polyvinyl chloride-sulfonated poly(styrene-co-acrylonitrile) [PVC-SP(ST-co-AN)] for proton exchange membrane fuel cell have been prepared through two steps. The first step was preparation of sulfonated poly(styrene-co-acrylonitrile) [SP(ST-co-AN)] by using solution polymerization and KPS as initiator and sulfonated the product of poly(styrene-co-acrylonitrile) [P(ST-co-AN)] which reacts with sulfuric acid. The second step was mixing polyvinyl chloride (PVC) and sulfonated poly(styrene-co-acrylonitrile) [SP(ST-co-AN)] with different ratio. Essential characters required for polyelectrolyte fuel cell membrane especially ionic conductivity, methanol permeability, ion exchange capacity (IEC), thermal stability and high mechanical properties were investigated. Ion exchange capacity increase with increase sulfonated poly(styrene-co-acrylonitrile) [SP(ST-co-AN)]. The methanol permeability of membrane which consider as essential character for PEM fuel cell application was found lower than of nafion. The obtained results are very promising and opening new area for conducting further investigations considering the very low price of polyvinyl chloride compared to nafion.

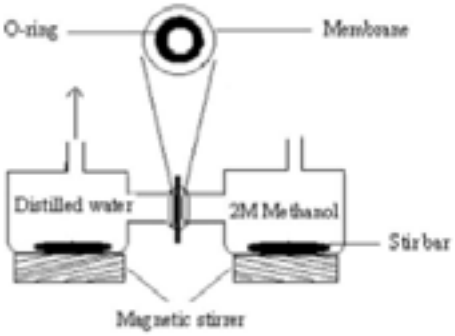

Figure 1: Glass diffusion cell for methanol permeability measurements.

Biography

Mohamed A. Abu-Saied has his expertise in polyelectrolyte membranes for fuel cell Application. His open and contextual evaluation (preparation and characterization) of polymer polyelectrolyte membranes for fuel cell application. He has built this model after years of experience in research, evaluation, teaching and administration in education institutions.

mouhamedabdelrehem@yahoo.com

Notes: