

International Journal of ChemTech Research

CODEN (USA): IJCRGG, ISSN: 0974-4290, ISSN(Online):2455-9555 Vol.10 No.15, pp 388-394, 2017

ChemTech

Synthesis of proton exchange membrane from SEPS copolymer for fuel cell applications

Baldiris-Navarro I.¹*, Realpe A.², Fajardo J.³, Mendoza D.¹, Acosta J.¹

 ¹Quality Control program, Ciptec Research Group, Engineering Faculty, Fundacion Universitaria Tecnologico Comfenalco, Colombia
²Department of Chemical Engineering, Research Group of Particles and Processes Modeling, Engineering Faculty, Universidad de Cartagena, Colombia

Abstract : In this paper proton Exchange membranes were synthetized from SEPS copolymer, which was modified by sulfonation reaction and addition of titanium dioxide. Membranes thickness, Water uptake, ion exchange capacity, infrared spectroscopy and performance tests in a fuel cell were applied to characterize the obtained membranes. Results showed that sulfonated and loaded membrane(2h and 2%) exhibited a thickness range of [0.0147mm - 0.0319mm], 6% of water uptake, 1.18 of ion exchange capacity, all these are due to the presence of sulfonic acid groups in the polymer chain which facilitate the proton transport mechanisms in the membrane. Additionally, the performance test showed that the fuel cell may yield a power density of 60 mW \cdot cm⁻². Therefore, the sulfonated and loaded membrane represents an alternative for the application as proton exchange membrane in fuel cells. **Keywords** : Proton exchange membrane, copolymer, sulfonation, fuel cell.

Baldiris-Navarro I. et al /International Journal of ChemTech Research, 2017,10(15): 388-394.
