عنوان مقاله:

Preparation and characterization of sulfonated polystyrene with sulfonated polyaniline/polyaniline copolymer as a polymer electrolyte membrane for proton conduction

محل انتشار:

کنفرانس بین المللی مطالعات میان رشته ای نانو فناوری (سال: 1398)

تعداد صفحات اصل مقاله: 16

نویسندگان:

Valiollah Mandanipour - *Department of applied chemistry, University of Gonabad, Gonabad, Iran*.

Masoumeh Salehi - *Department of chemistry, University of Yasuj, Yasuj, Iran*.

Asieh Abbasi - *Instructor of Occupational Health Engineering , Department of Occupational Health Engineering, Sirjan School of Medical Sciences, Sirjan, Iran*.

خلاصه مقاله:

A novel polymer electrolyte membrane has been prepared using copolymer sulfonated polyaniline/polyaniline (CoPANI)-sulfonated polystyrene (SPS)–polyethylene (PE). The membrane is characterized by FTIR, SEM and TGA/DSC. Water uptake, oxidative resistance, ionic conductivity and methanol permeability are measured to evaluate its performance in a direct methanol alkaline fuel cell. The on-set degradation temperature of the SPS is above 120œC. The membranes were confirmed to retain 1–5% water vapor at 80–140 œC in air due to the hydrophilic of highly SPS. The ionic conductivity and permeability of the membrane to methanol was found to increase with temperature increasing. The membrane CoPANI-SPS–PE shows the proton conductivity of 2.95× 10-2 S cm-1 at 100 œC and even around 4.20 × 10–2 S cm-1 at 120 œC without extra humidity supply and is very promising for high temperature fuel cells with low humidity. The high proton conductivity is ascribed to the unique composition in which the heterocyclic polymer provides the proton motion by construction diffusion and the highly SPS polymer retains water vapor to lower the activation energy for proton conduction.

کلمات کلیدی:

Copolymer sulfonated polyaniline-polyaniline, sulfonated polystyrene, Polymer electrolyte membrane, Direct methanol fuel cells.

لینک ثابت مقاله در پایگاه سیویلیکا: