Supatra Patrawoot 2007: Characterization and Investigation of Mechanical Strength Property of Polysulfone-Inorganic Composite Membranes for Fuel Cell Application. Master of Engineering (Chemical Engineering), Major Field: Chemical Engineering, Department of Chemical Engineering. Thesis Advisor: Assistant Professor Nanthiya Hansupalak, Ph.D. 43 pages.

This research was to modify of poly(arylene ether sulfone) and to characterize of sulfonated poly(arylene ether sulfone). It also focused on adding the inorganic mixture of phosphotungsatic acid (PWA) and ZSM-5 to form composite polymeric membranes. The post sulfonation of the poly (arylene ether sulfone) was done in-house and characterized by fourier transform infrared (FTIR) and proton-nuclear magnetic resonance (H-NMR). In this work, PWA/ZSM-5 composite membranes were of interest. These membranes were then characterized the properties by using thermo gravimetric analysis (TGA), ion exchange capacity (IEC), water uptake, and tensile strength, as well as Young's moduli. Expectedly, the amount of sulfonated groups attached onto poly (arylene ether sulfone) was 8% by mole, calculated using H-NMR. The degradation of membranes was thermally indicated about 200^{o}C. Effect of inorganic on membrane properties were reported.

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