VISCOSITY, RHEOLOGY AND MORPHOLOGICAL PROPERTIES OF SULFONATED POLY (ETHER ETHER KETONE): EFFECTS OF SOLVENT AND TEMPERATURE

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ABSTRACT

Poly (ether ether ketone) (SPEEK) is one of the promising PEM fuel cell membrane materials. Here, some basic properties such as viscosity, rheology of two SPEEK (1.3 and 1.6 meq/g) samples have been investigated and will be reported. And effects of different parameters such as solvent medium and temperature on these properties will also be reported. It was found that both the SPEEK samples flows normal norm of viscosity with the increasing temperature. It was observed that the shear thinning behavior and the dynamic viscosity decreases for both the SPEKK sample with the increasing shear rate. SPEEKS samples showed a limited dynamic viscosity value at higher frequency. Strong modulus G′ behaves linearly at lower frequency but it drops slowly in higher frequency from 2146.7 Pa to 1669.22 Pa; this is mainly due to the different in degree of sulfonation and polydispersity of the individual SPEEKS. Membrane prepared with dimethylformamide (DMF) shows better homogeneity, when the cross-section of the membranes was investigated by scanning electron microscope.