Preparation and Properties of SeO₂ and PWA Binary Compound Doped SPEEK Proton Exchange Membranes

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Herein, we prepared proton exchange membranes by adding SeO₂ and phospho-wolframic acid (PWA) into DS 85 wt% sulfonated polyether ether ketone (SPEEK). The result indicates that their proton conductivity is increasing without decrease of their methanol permeability. SeO₂ has a "V" type of lattice which provides favorable channels for proton transfer. The structures of composite membranes had changed in the chemical reactions. The characteristic peaks of Keggin in PWA appeared in infrared spectrum, but some peaks disappeared in X-ray diffraction pattern. Moreover, the result reveals that their proton conductivities is gradually increasing. After treated with an 8 T high magnetic field at 120°C for 10 h, the composite membranes showed anti-magnetic property. The thermal performance of composite membranes with SeO₂ and PWA molar ratio of 2:1 increased obviously.

Keywords: Electrochemical properties, SeO₂, PWA, Binary compound doped

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