

Proton Conducting Composite Membranes from Polyether Ether Ketone and Heteropolyacids for Fuel Cell Applications

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Abstract

A series of composite membranes based on sulfonated polyether ether ketone with embedded powdered heteropolycompounds was prepared and their electrochemical and thermal properties were studied. An increase in degree of sulfonation as well as introduction of these fillers resulted in increased T_g and enhanced membrane hydrophilicity, bringing about a substantial gain in proton conductivity. The conductivity of the composite membranes exceeded 10^{-2} S/cm at room temperature and reached values of about 10^{-1} S/cm above 100°C .

Keywords: Composite membranes; Electrochemistry; Ion-exchange membrane; Polyether ether ketone (PEEK); Heteropolyacids