

Preparation and characterization of composite membranes using blends of SPEEK/PBI with boron phosphate

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Abstract

In this contribution composite membranes have been prepared from acid–base polymer blend and solid inorganic proton conductive boron phosphate (BPO_4). The blends are composed of sulfonated polyether-ether ketone (SPEEK) as the acidic component and polybenzimidazole (PBI) as the basic component. The contents of solid BPO_4 in the composite membrane varied from 10 to 40 wt%. The conductivity of the composite membranes was measured by impedance spectroscopy at room temperature. The conductivity of the composite membranes was found to increase with the incorporation of boron phosphate particles into blend membranes. The highest conductivity of 6 mS/cm was found for composite membrane at room temperature. The membranes were characterized by X-ray diffraction (XRD), differential scanning calorimetry (DSC), and FTIR which showed acid–base interaction in the blend membranes and also confirmed the presence of solid BPO_4 into the composite membranes. These membranes show good perspective in the membrane fuel cell applications.

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