

Electrical properties of sulfonated polyether ether ketone/polyetherimide blend membranes doped with inorganic acids.

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Abstract

The influence of blending with Ultem poly(ether imide) (PEI) and doping with HCl and H₃PO₄ on the properties of sulfonated poly(ether ether ketone) (SPEEK) was studied. Blending with PEI first results in an increase and then in a decrease in membrane swelling at PEI concns. greater than 5%. The elec. cond. of blend membranes follows the same trend. Doping with the acids enhances the cond. several-fold, and the effect of doping with HCl is more significant. PEI forms spherical particles dispersed in the SPEEK matrix and, at the same time, partially dissolves in SPEEK, which reduces the swelling of the matrix at higher PEI concns. The increase in the membrane capacity to absorb water at small PEI contents is due to the formation of new water adsorption sites along the interface between the particles and the matrix. A modified effective medium model yielded calcd. results in good agreement with the measured cond. values, when the exptl. absorption data were used in the simulation.