

Effects of gamma radiation treatment and plasticizer on alkaline solid polymer electrolytes

ABSTRACT

Alkaline solid polymer electrolyte films have been prepared by the solvent-casting method. Gamma radiation treatment and propylene carbonate plasticizer were used to improve the ionic conductivity of the electrolytes at ambient temperature. The structure of the irradiated electrolytes changes from semi-crystalline to amorphous, indicating that the crosslinking of the polymer has been achieved at a dose of 200 kGy. The ionic conductivity at room temperature of PVA/KOH blend increases from 10^{-7} to 10^{-3} S \cdot cm $^{-1}$ after the PVA crosslinking and when the plasticizer concentration was increased from 20 to 30%.