

PVDF(HFP) gel electrolytes based on 1-(2-hydroxyethyl)-3-methyl imidazolium and N-(2-hydroxyethyl)-N-methyl morpholinium ionic liquids

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PVDF(HFP) gel electrolytes were prepared by ILs based on 1-(2-hydroxyethyl)-3-methyl imidazolium and N-(2-hydroxyethyl)-N-methyl morpholinium cation. The prepared ionic liquid-polymer gel was a freestanding and rubbery film, in which the degree of transparency was different according to the ratio and kind of ionic liquid. It is confirmed through DSC that the thermal behaviors of the ionic liquid-PVDF(HFP) gels were similar to those of pure ionic liquid. However, the glass transition temperatures of ionic liquid-PVDF(HFP) gels were increased, compared to the pure ionic liquid. In the electrochemical property, ionic conductivities of the gels were measured. Particularly, in the case of the ratio 1.1:1 of ionic liquid : PVDF(HFP) polymer, the ionic conductivities of the gels was 10^{-1} times lower than pure ionic liquid. Also, the surface structures of ionic liquid-PVDF(HFP) gels were observed by SEM photographs in order to evaluate the morphologies of film surface according to the composition ratio and nature of ionic liquid.