Nanocomposites of polymer gel electrolyte based on poly (ethylene glycol) diacrylate and Mg-Al layered double hydroxides

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The present paper described the synthesis and characterization of nanocomposites materials composed of the polymer gel electrolyte and layered double hydoxide (LDH) inorganic filler. Mg-Al LDHs were prepared varying the ratio of Mg/Al. It was observed that the layered structure of Mg-Al LDH was totally exfoliated by the PEGDA. The ionic conductivity highly enhanced in the nanocomposite systems. In the case of the composite films having 4.5 wt.% of the Mg-Al LDH, the ionic conductivity reached to 1.6 x 10-3 S/cm at room temperature. The incorporation of nanoparticle into the gel resulted in the increase in the tensile modulus by 2 to 3 times.