

A novel composite gel electrolyte for solid-state dye sensitized solar cells

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In this study, a new HPAs- PEO composite electrolyte was prepared by simple method with a common solvent such as acetonitrile and mixed solvent (chloroform: methanol). The unique properties of HPAs such as their Keggin type structure, long transient life time and decreased electron-hole recombination on TiO₂ surface results in the decrease of the charge transfer resistance and improves the ionic conductivity of composite electrolyte. With this pioneering composite (HPAs/PEO), the fabricated DSSCs achieved moderately well conversion efficiency of 3.1% with open circuit voltage (VOC) of 0.520 volt and short circuit current (ISC) of 9.7 mA/cm² under 100 mW/cm² (AM1.5) illumination. The prepared HPA-PEO composites were characterized by XRD, FT-IR, FESEM, DSC and ionic conductivity properties.