Performance Enhancement for Quasi-Solid-State Dye-Sensitized Solar Cells Derived from Carbonized Polyvinylidene Dichloride Embedded Electrolyte

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Dye sensitized solar cell (DSSC) has been attention for alternative because of low cost, simple fabrication, and abundant and accessible source of renewable energy. The liquid electrolyte usually used in DSSCs, but leakage and evaporation of liquid electrolyte are critical for long term application of DSSC. To overcome this limitation, gel polymer electrolyte have preferred. In this study concentration effect of conductive additives, Polyvinylidene dichloride (PVDC) derived carbon, was prepared and characterized. By optimizing amount of carbonized PVDC, poly(ethylene glycol) reduces its crystallinity amd boosts ionic conductivity. The crystallinity of polymers was calculated from glass transition temperature and enthalpy by differential scanning calorimetry (DSC). Some aggregated carbon filed up onto electrode forms electronic conductive path. The photovoltaic performance was compared by fill factor, short - circuit current, photovoltage, energy conversion efficiency, electrochemical impedance spectroscopy and incident photon-to-electron conversion efficiency.