Ionic liquid based polymer electrolyte via surfactant-assisted polymerization for enhancement in stability of dye sensitized solar cell

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Ionic liquid based polymer electrolyte is present for addressing the instability of liquid electrolyte in dye-sensitized solar cell. Polymer electrolyte films are obtained by the surfactant-assisted polymerization at the plasma-liquid interface with polymerization process of ionic liquids and ethylene oxide-based surfactants to the polyelectrolyte matrix. The chemical structure and properties of the polymer electrolyte are characterized by scanning electron microscopy (SEM), Fourier transformation infrared spectroscopy (FT-IR), nuclear magnetic resonance (NMR) spectroscopy, X-ray photoelectron spectroscopy (XPS), differential scanning calorimetry (DSC). The electrochemical characterizations of polymer thin films are also characterized by electrochemical impedance spectroscopy (EIS) and Tafel analysis.