

Functional Materials Based on Ionic Liquid for Dye-sensitized Solar Cells and Separation Membranes

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The use of ionic liquids is prolific across various different areas of scientific research. This continuously remarkable interest is motivated by their physicochemical unique properties such as high thermal stability, high ion conductivity, non-flammable, non-toxic, non-volatile. Additionally, ionic liquids can be selectively tailored by judicious choice of the cation and anion applicable for broad electrochemical window and gas separation. However, ionic liquid has limited by liquid-state to expand feasible field where solid-state materials appealing. Novel solidified ionic liquid by free-radical polymerization, atomic transfer radical polymerization (ATRP), crystallization, grafting to inorganic surface possesses nature of ionic liquid as well as solid material properties as good mechanical strength and stability. These ionic liquids accelerate the advancement of highly efficient iodine-free solid-state electrolyte for dye-sensitized solar cells (DSSCs). Furthermore, free-standing separation membrane based on polymerized ionic liquid innovate performance and production process.