Facile Synthesis of Supramolecular Polymer Containing Quadruple Hydrogen Bonding Units

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This work has demonstrated the facile, efficient route for synthesizing supramolecular polymers containing quadruple hydrogen bonding sites. Poly(ethylene glycol diglycidyl ether) (PEG DGE) was used a model polymer to produce the supramolecular structure of polymer. The current approach presented here involves a single-step reaction between the amine of MIC and the epoxy group of polymer, as verified using FT-IR spectroscopy. It also illustrates an advantageous route over the previous method because it does not need the selective use of monofunctionalized precursor and does not produce a dead, difunctionalized precursor. As a result, the mechanical properties of supramolecular polymer were enhanced by more than 104 times compared to the pristine low molecular weight state from liquid to solid. These supramolecular polymers will be applied to polymer electrolytes for dye-sensitized solar cells.