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Synthesis, characterizations and electrochromic properties of polymers based on functionalized anthracene

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Abstract

A monomer named (2,5-bis(anthrancen-9-yl)-3,4-ethyldioxythiophene) (An-EDOT-An) has been synthesized, which is difficult to electropolymerize on the electrode via electrochemical method in conventional solvents such as acetonitrile (ACN), propylene carbonate (PC) and aqueous system. However, an assembled solid device based on the monomer has been fabricated by applying a potential of 2.5V. The device can present remarkable electrochromic behavior under various external applied potentials. In addition, An-EDOT-An can be a good co-monomer for preparation of copolymers with other monomers such as thiophene, selenophene, 3-methylthiophene and EDOT, and the electrochromic properties can be greatly tuned by the polymerization solvent. The derived copolymers exhibit multicolor electrochromism, reasonable switching response and stability, which is satisfactory for applications on electrochromic devices.

Keywords

2,5-Bis(anthrancen-9-yl)-3,4-ethyldioxythiophene, Electropolymerization, Copolymers, Multicolor electrochromism