CYAN TO HIGHLY TRANSMISSIVE SOLUBLE ELECTROCHROME BASED ON DONOR-ACCEPTOR APPROACH

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Optical properties of a polymer can be tuned via changing donor and acceptor groups in the monomer unit [1]. In this study, a novel series of donor-acceptor-donor type monomers containing thiophene, 3,4-ethenedioxythiophene and 3,4-propylenedioxythiophene (ProDOT) as donor units and oxadiazole as acceptor units was synthesized and polymerized chemically and electrochemically. Among the synthesized polymers, polymer (PPOP) bearing ProDOT units has a narrow band gap (1.4 eV) and exhibits a scarce electrochromic property: dark cyan color in neutral state and transparent in oxidized state (Figure 1). This electrochrome has 270 cm²/C coloration efficiency value and quite low response time as 0.9 s (at 697 nm). Based on these properties with solubility and having cyan color, this polymer could be an excellent candidate for the future CMY (Cyan- Magenta- Yellow) color pallet.

Figure 1. Spray coating of chemically obtained PPOP on ITO and its colors in neutral and oxidized state.

Reference