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Electrochemical and optical properties of an azo dye based conducting copolymer

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Abstract: The electrochemical and optical properties of a novel conducting copolymer called poly(2,5'-dimethyl-[4-(2,5-di-thiophen- 2-yl-pyrrol-1-yl)-phenyl]azobenzene-co-(3,4-ethylenedioxythiophene)) (poly (1-co-EDOT)) are reported. Electrochemically synthesized poly(1-co-EDOT) based on the azo dye has a well-defined and reversible redox couple (0.37 V vs. Ag/AgCl) with good cycle stability. The copolymer film exhibits high conductivity (13 S/cm) as well as electrochromic behavior (magenta when neutralized and transmissive sky blue when oxidized). Furthermore, electro-optically active copolymer film has a low band gap of 1.79 eV with a π-π^* transition at 555 nm.

Key Words: Conducting polymers, copolymers, dithienylpyrrole, azobenzene, EDOT.

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