A NEW SPIRO TYPE POLYMERIC ELECTROCHROME BASED ON PROPYLENEDIOXYSELENOPHENE

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It is well-known that the types of heteroatoms in similar heterocyclic units affect the intrinsic properties (conductivity, optical and electronic properties, stability, etc.) of corresponding polymers. For example, the replacement of sulfur atom by selenium atom will result in a new electrochromic polymer bearing interesting properties since the selenium atom has larger atomic size, less electronegativity and more metallic character when compared to the sulfur atom [1]. The arrangement of atoms is also very important in a system as well as the kind of heteroatom. Reynolds and his coworkers, for instance, reported a new spiro type polymeric electrochrome exhibiting multielectrochromic properties [2]. Therefore, under the light of this information, in the study, the design and synthesis of a novel spiro type electrochromic polymer based on 3,4-propylenedioxyselenophene units were reported. Electrochemically polymerized monomer exhibited low band gap and electrochromic properties. In order to investigate the effect of heteroatom on electrochromic properties in the similar systems, the intrinsic properties of selenophene based polymer was also compared with its thiophene analogue (Scheme 1).

References