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Article

Two New Bithiophenes Derivatives Multielectrochromic Copolymer Based on Triphenylamine Unit and Their Application for Electrochromic Devices

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Abstract

Two monomers including 4,4Ãƒ Â¢Ã‚Â€Ã‚Â²,4Ãƒ Â¢Ã‚Â€Ã‚Â³Ãƒ Â¢Ã‚Â€Ã‚Â•tris(3Ãƒ Â¢Ã‚Â€Ã‚Â•methox

ythiopheneÃƒÂ¢Ã‚Â€Ã‚Â•2ÃƒÂ¢Ã‚Â€Ã‚Â•yl)triphenylamine (**M1**) and 4,4ÃƒÂ¢Ã‚Â€Ã‚Â²,4ÃƒÂ¢Ã‚Â€Ã‚Â³ÃƒÂ¢Ã‚Â€Ã‚Â•tris(3,4ÃƒÂ¢Ã‚Â€Ã‚Â•dimethoxythiopheneÃƒÂ¢Ã‚Â€Ã‚Â•2ÃƒÂ¢Ã‚Â€Ã‚Â•yl)triphenylamine (**M2**) with triphenylamine as their core were synthesized and the corresponding polymers were obtained by electrochemical polymerization. Their electrochemical properties were investigated using scanning electron microscopy, UVÃƒÂ¢Ã‚Â€Ã‚Â“Vis, and cyclic voltammetry. It was found that the two polymers had reversible redox behavior with the different color change under the applied potentials. Both the polymers displayed high switching efficiency and optical contrast. Moreover, the corresponding electrochromic devices (ECDs) employing the synthesized polymers and poly(3,4ÃƒÂ¢Ã‚Â€Ã‚Â•ethylenedioxythiophene) were constructed. The spectroelectrochemical experiments illustrated that the ECDs exhibited fast response time, reasonable optical contrast, favorable optical memories, and redox stability.

Supporting Information

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