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Polyaniline Films with Modified Nanostructure for Bifunctional Flexible Multicolor Electrochromic and Supercapacitor Applications

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Abstract: The flexible polyaniline (PANI) thin films with modified nanostructure are prepared on flexible indium tin oxide (ITO) /polyethylene terephthalate (PET) substrates by combination of galvanostatic and cyclic voltammetric electrodeposition techniques. The electrochemical properties of as-prepared PANI nanomaterials are investigated by using the PANI film as an active material of the electrode for primary electrochromic device and electrochemical supercapacitor. This film presents a remarkable mechanical flexibility, high coloration efficiency of $80.9 \text{ cm}^2 \text{ C}^{-1}$ at 630 nm and noticeable multicolor performances with reversible color change of transparent, pale yellow, green, blue and blue-purple. Further, a smart supercapacitor is presented, and the level of energy storage can be monitored by the change of optical

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