Planner circuit designed highly flexible supercapacitor films from PEDOT/PVP/$MnCO_3$ ternary composite for smart device compatible

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A high performance flexible planner supercapacitor electrodes were fabricated using poly (3,4-ethylenedioxythiophene) polystyrene sulfonate (PEDOT) embedded polyvinylpyrrolidone (PVP)/$MnCO_3$ composites under hydrothermal technique. The chemical compositions, surface morphologies, crystalline studies of the consequential composites were examined by carrying out Fourier transform infrared spectroscopy, X-ray photoelectron spectroscopy, Scanning electron microscopy and X-ray diffraction studies. The XPS summaries of the composites revealed typical peaks of Mn 2p1/2 (653.1 eV), Mn 2p3/2 (641.9 eV), N1s (401.4 eV), and C1s (285.3 eV). The planar designed supercapacitor showed notable areal capacitance of ~48 $mFcm^{-2}$ and a gravimetric specific capacitance of 360 Fg^{-1} with good energy density. The supercapacitor demonstrated excellent capacity preservation of 90% subsequently 100,000 charge-discharge cycles. The highly flexible PEDOT/PVP/$MnCO_3$ composite based planar supercapacitor fabricated in this report was initiated to appropriate for application in smart electronic devices and wearable electronics as energy storage system.