

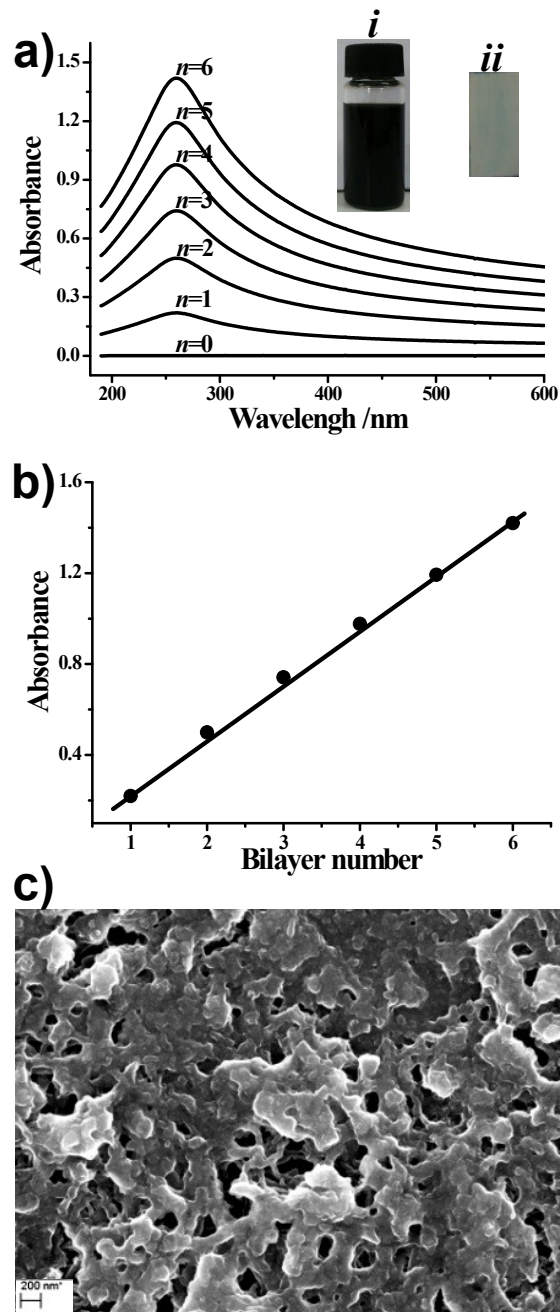
## Supporting Information

### **pH-Switchable Electroactive Composite Films of Carboxylated Multi-walled Carbon Nanotubes and Prussian Blue**

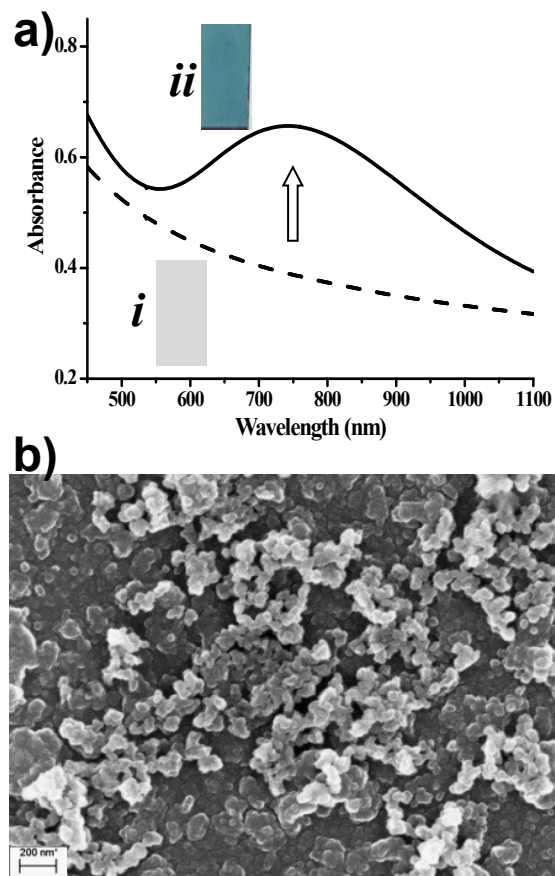
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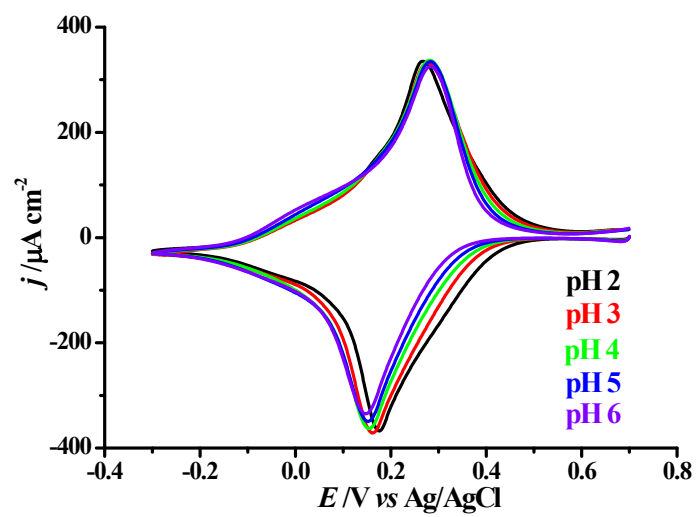
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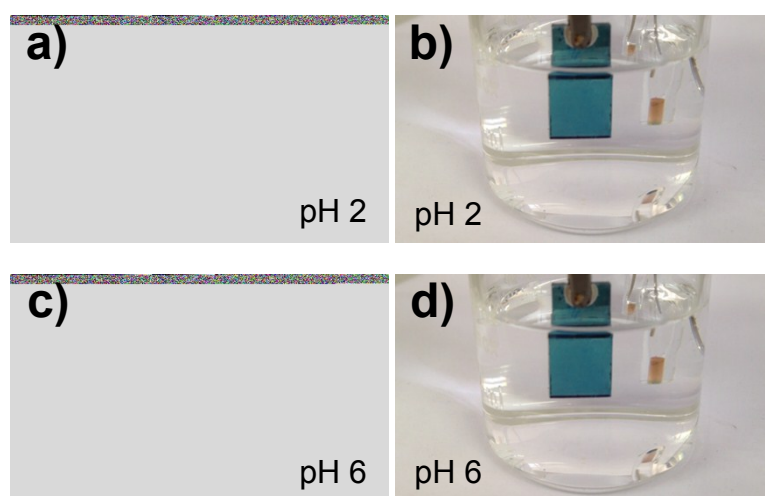
**Fig. S1** a) UV-vis absorption spectra of the CMWCNT multilayers. Inset: photographs of the CMWCNTs dispersed in aqueous solution (item *i*) and the CMWCNT multilayer film (item *ii*). b) Plot of the linearity between the absorbance values at 260 nm versus the bilayer number. c) SEM image of the CMWCNT multilayer film.



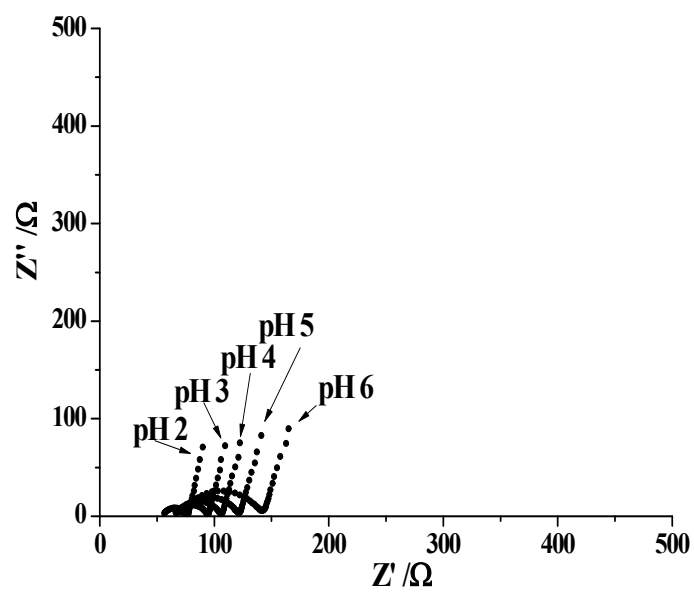
**Fig. S2** a) UV-vis absorption spectra of the CMWCNTs@PB composite film (solid line) and the CMWCNTs film (dashed line). Inset: photographs of the CMWCNTs film (item *i*) and the CMWCNTs@PB composite film (item *ii*). b) SEM image of the CMWCNTs@PB composite film.



**Fig. S3** Cyclic voltammetric curves of the PB modified ITO electrode prepared via an electrochemical PB deposition method at different pH values at a scan rate of 20  $\text{mV s}^{-1}$ .



**Fig. S4** Screen pictures captured from the videotapes of the PB modified ITO electrode undergoing cyclic potential sweeps between 0.6 and 0.1 V vs Ag/AgCl at a scan rate of  $20 \text{ mV s}^{-1}$ . a) pH 2, 0.1 V; b) pH 2, 0.6 V; c) pH 6, 0.1 V; d) pH 6, 0.6 V. The light grey was the color of the CMWCNT multilayer-coated ITO glass. From these pictures, it can be seen that the PB modified electrode has the common electrochromic behaviors regardless of pH.



**Fig. S5** Electrochemical impedance spectra of the PB modified electrode at different pH.