

# **Understanding the Effect of Polypyrrole and Poly(3,4-ethylenedioxythiophene) on Enhancing the Supercapacitor Performance of NiCo<sub>2</sub>O<sub>4</sub> Electrode**

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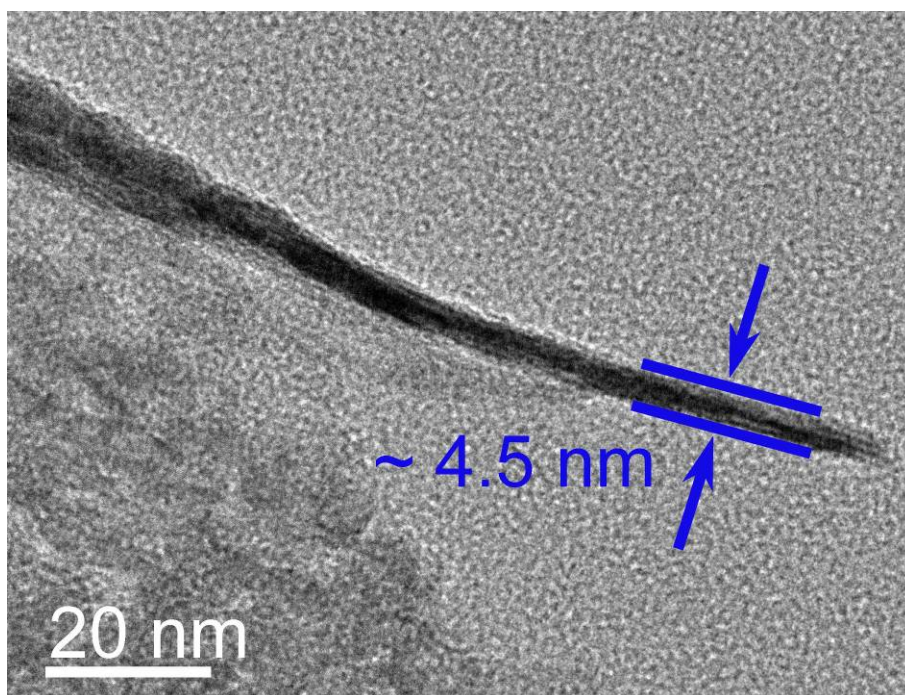
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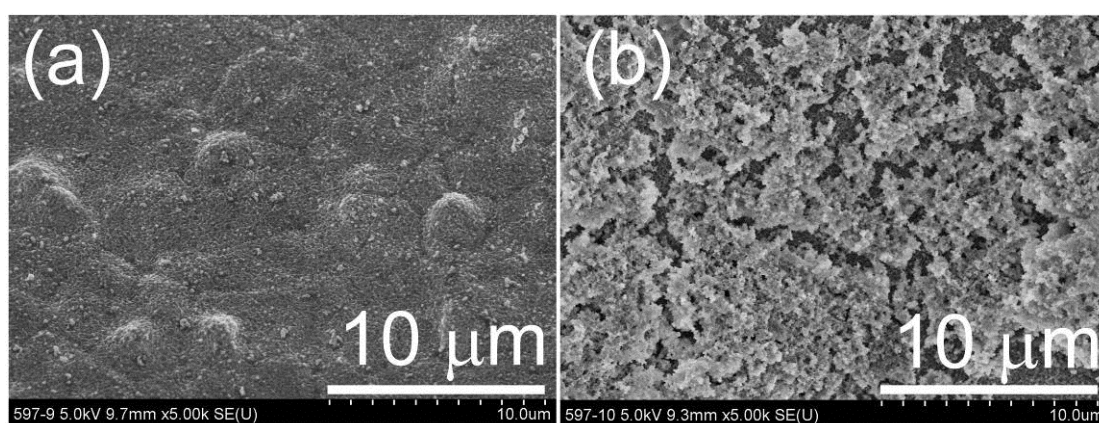
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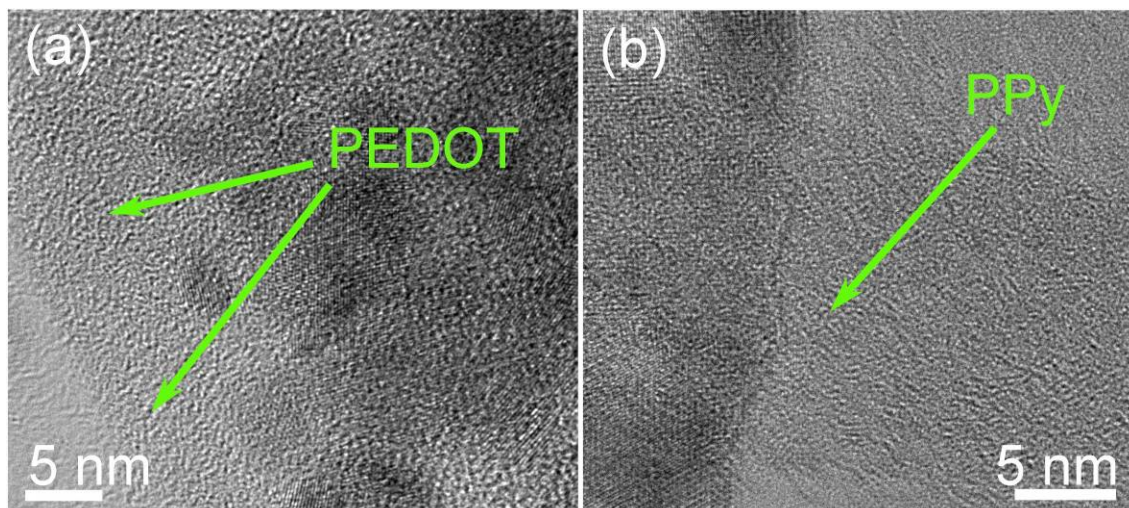




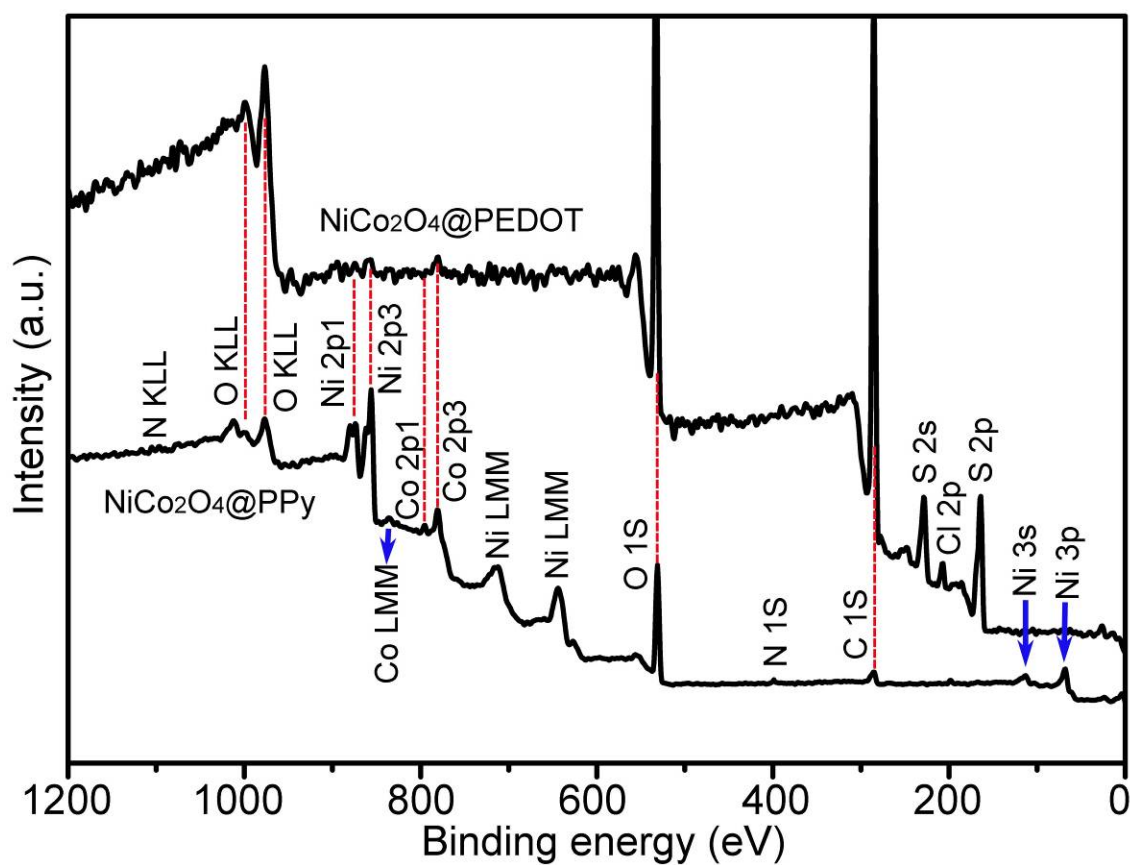
**Figure S3.** TEM image of the NiCo<sub>2</sub>O<sub>4</sub> ultrathin nanosheet.



**Figure S4.** SEM image of (a) PEDOT and (b) PPy directly grown on the Ni foam

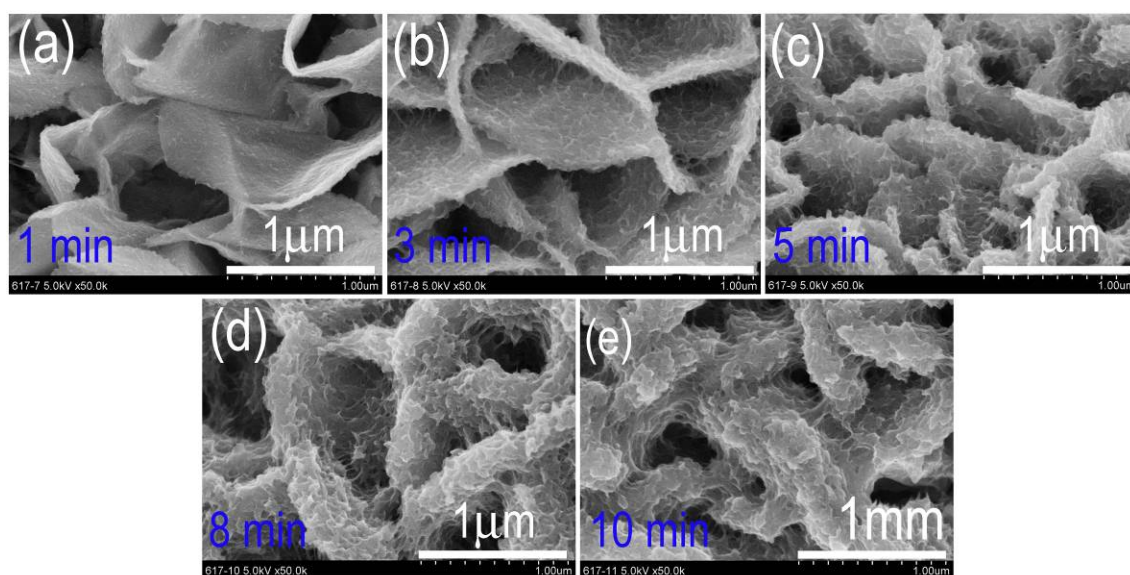


**Figure S5.** TEM image of (a)  $\text{NiCo}_2\text{O}_4@\text{PEDOT}$  and (b)  $\text{NiCo}_2\text{O}_4@\text{PPy}$  hybrid composites, showing that the PEDOT and PPy layer is amorphous.

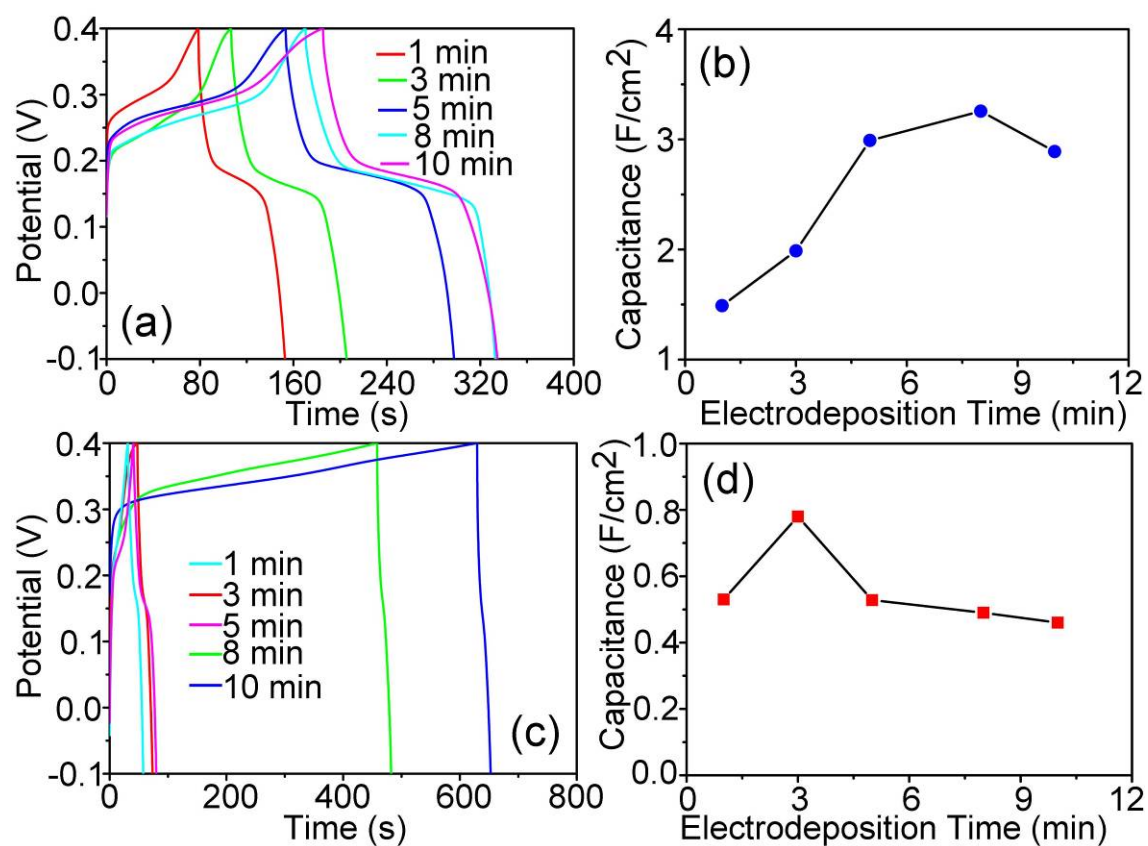


**Figure S6.** XPS survey spectra of  $\text{NiCo}_2\text{O}_4@\text{PPy}$  and  $\text{NiCo}_2\text{O}_4@\text{PEDOT}$  hybrid composites.



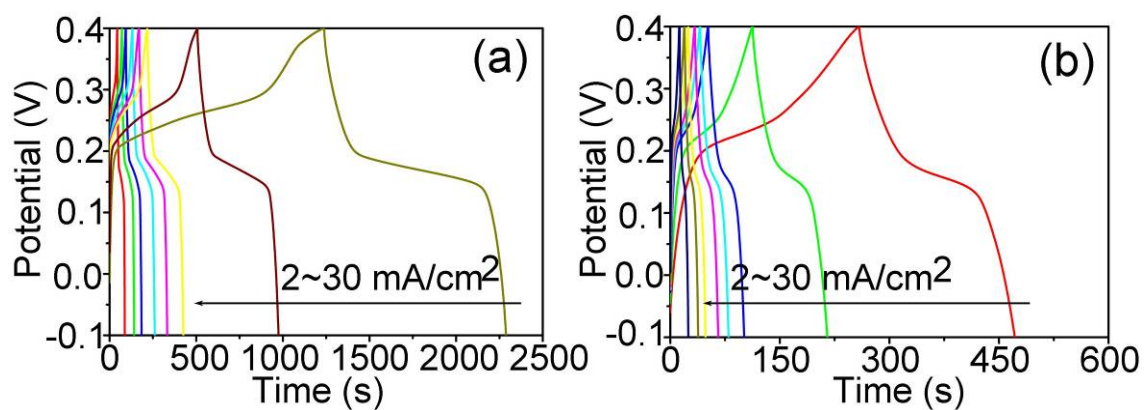


**Figure S7.** SEM images of the morphology evolution of  $\text{NiCo}_2\text{O}_4@\text{PEDOT}$  hybrid composites at different deposition time.

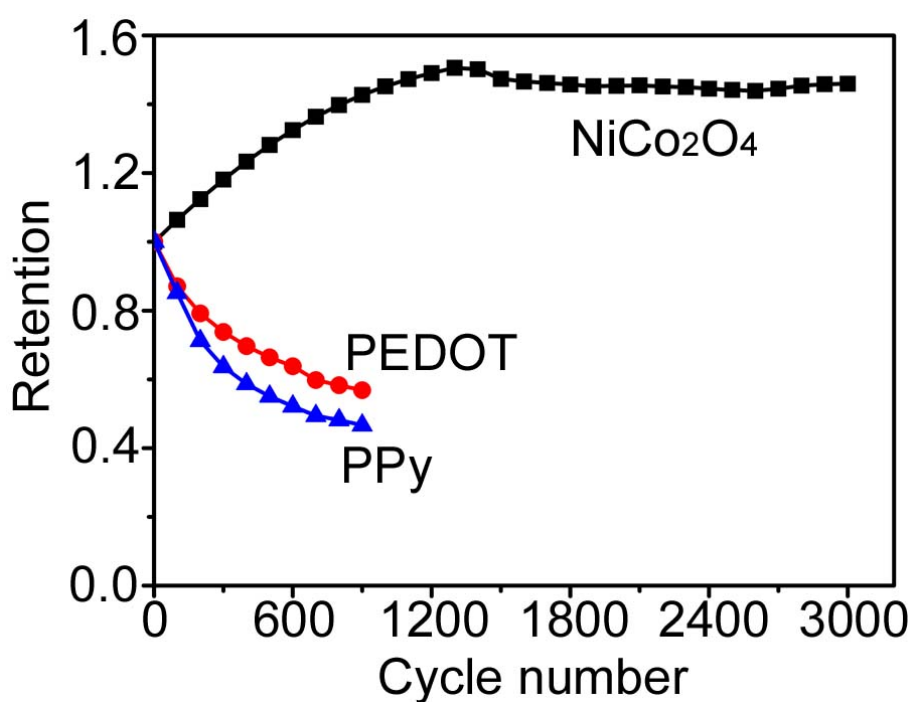


**Figure S8.** (a) CD curves and (b) areal capacitance of the  $\text{NiCo}_2\text{O}_4@\text{PPy}$  electrode as a function of the PPy electrodeposition time. (c) CD curves and (d) areal capacitance

of the  $\text{NiCo}_2\text{O}_4@\text{PEDOT}$  electrode as a function of the PEDOT electrodeposition time.



**Figure S9.** (a,b)CD curves of the  $\text{NiCo}_2\text{O}_4@\text{PPy}$  and  $\text{NiCo}_2\text{O}_4@\text{PEDOT}$  electrode at different current densities, respectively.



**Figure S10.** Cycling performance of pure  $\text{NiCo}_2\text{O}_4$ , PEDOT and PPy electrodes.