Supporting Information

Calculation method:

For the electrode:
The areal capacitance C_s was calculated from the CV curves through the following equation:

$$C_s = \frac{\int IdU}{2vsU_w} = \frac{S}{2vsU_w}$$

where v is the scan rate, s is the surface area of the electrode, S is the area of the closed CV curve and U_w is the potential window.
The capacitance C can be calculated from the GCD curves through the following equations also:

$$E_{GCD} = \int IUdt = IS = \frac{CU_w{}^2}{2}$$

$$C = \frac{2IS}{U_w{}^2}$$

where E_{GCD} is the energy stored during the discharging process, I is the constant current density, S is the area of the closed discharged curve from the GCD curves, C is the capacitance and U_w is the potential window.

For the device:
The C_s were calculated from the GCD curves same as above.
And the energy density and the average power density can be gained by employing the following equation:

$$E = \frac{C_{ave}U_w{}^2}{2}$$

$$P = \frac{E}{t}$$

in which C_{ave} is the C_s calculated before and t is the discharge time.

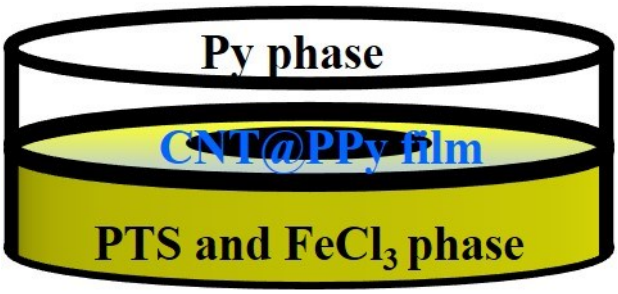

Fig. S1. Schematic diagram of the preparation of PPy coated CNT film.

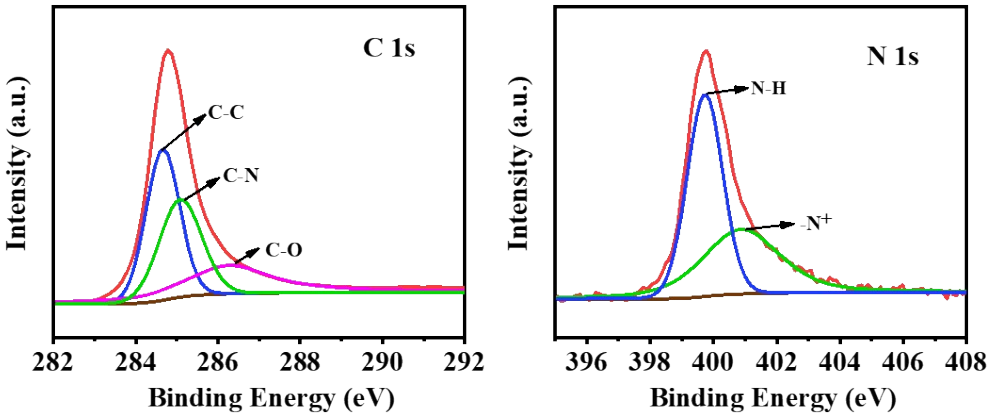

Fig. S2. C1s and N1s spectra of CNT@PPy electrodes.

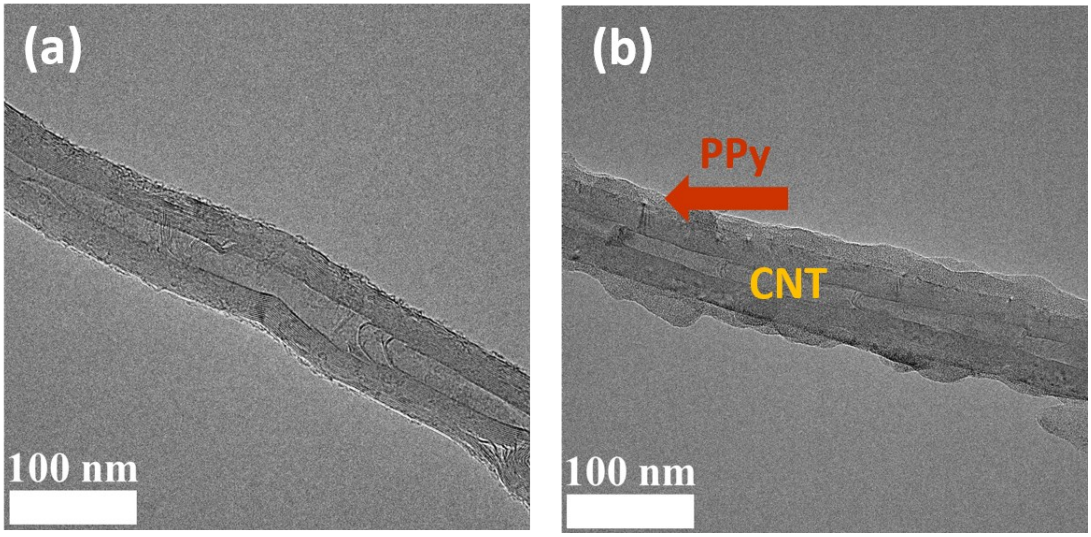

Fig. S3. TEM images of pure CNT and CNT@PPy electrodes.

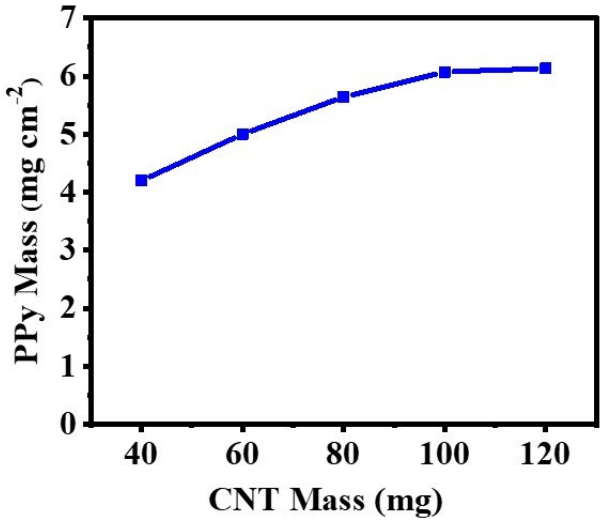

Fig. S4. The mass loading of PPy on 40, 60, 80, 100 and 120 mg CNT films.

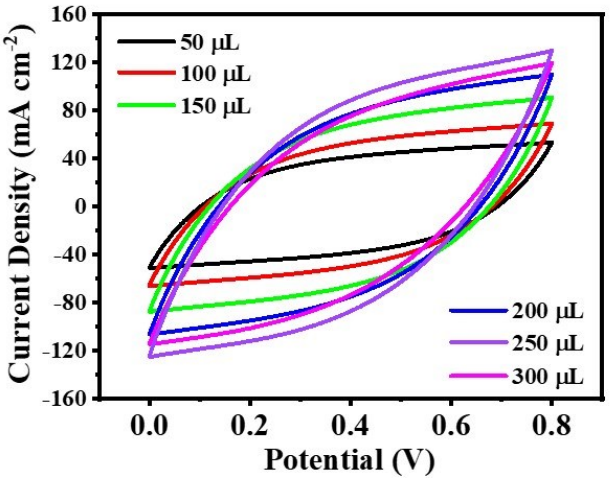

Fig. S5. The CV curves at 50 mV s^{-1} of the 50, 100, 150, 200, 250 and 300 μL Pyrrole.

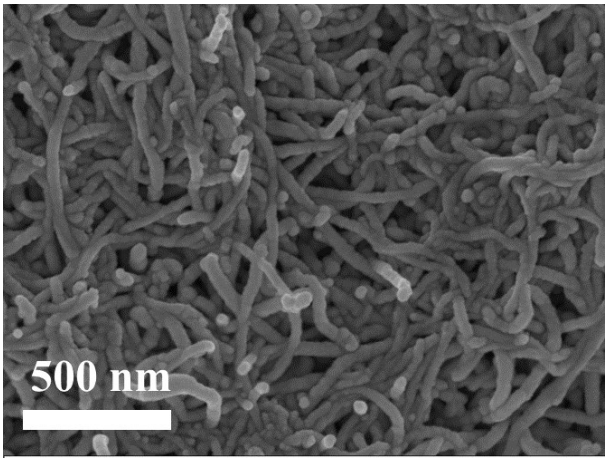

Fig. S6. SEM images of the CNT@PPy-100 film after ultrasonicating for 30 min.