

Supplementary Information for Hydrovoltaic Power Generation from Multiwalled Carbon Nanotubes

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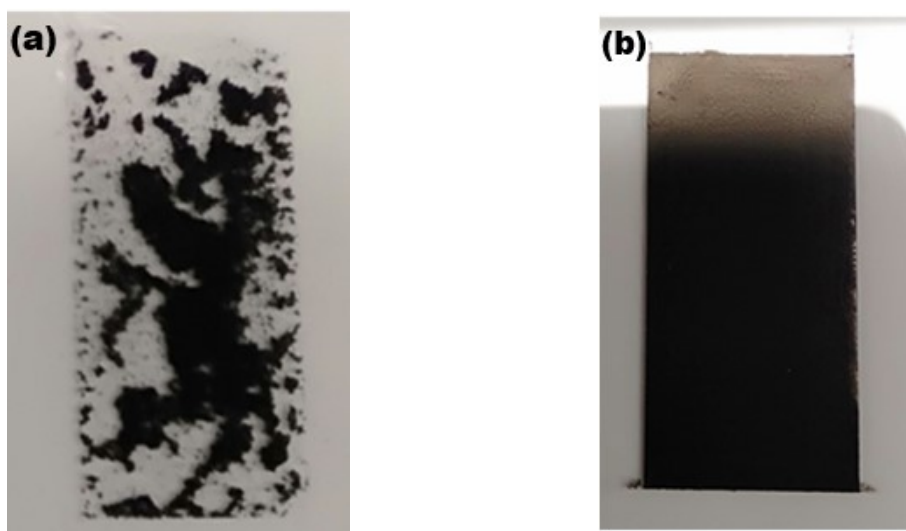


Figure S1. (a) Digital image of device prepared with 2 mg of CMWCNT, (b) Digital image of device prepared with 2 mg of FMWCNT.

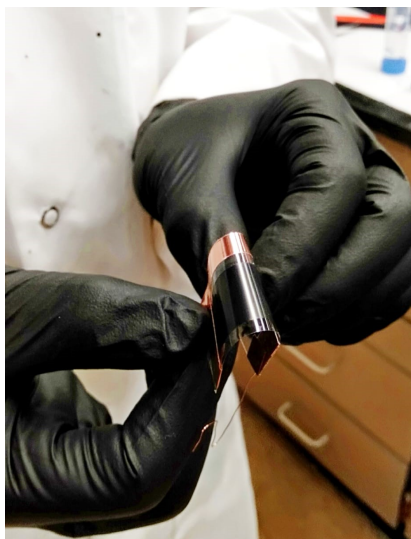


Figure S2. Digital images of FMWCNTs representing the level of flexibility without deformation of the device.

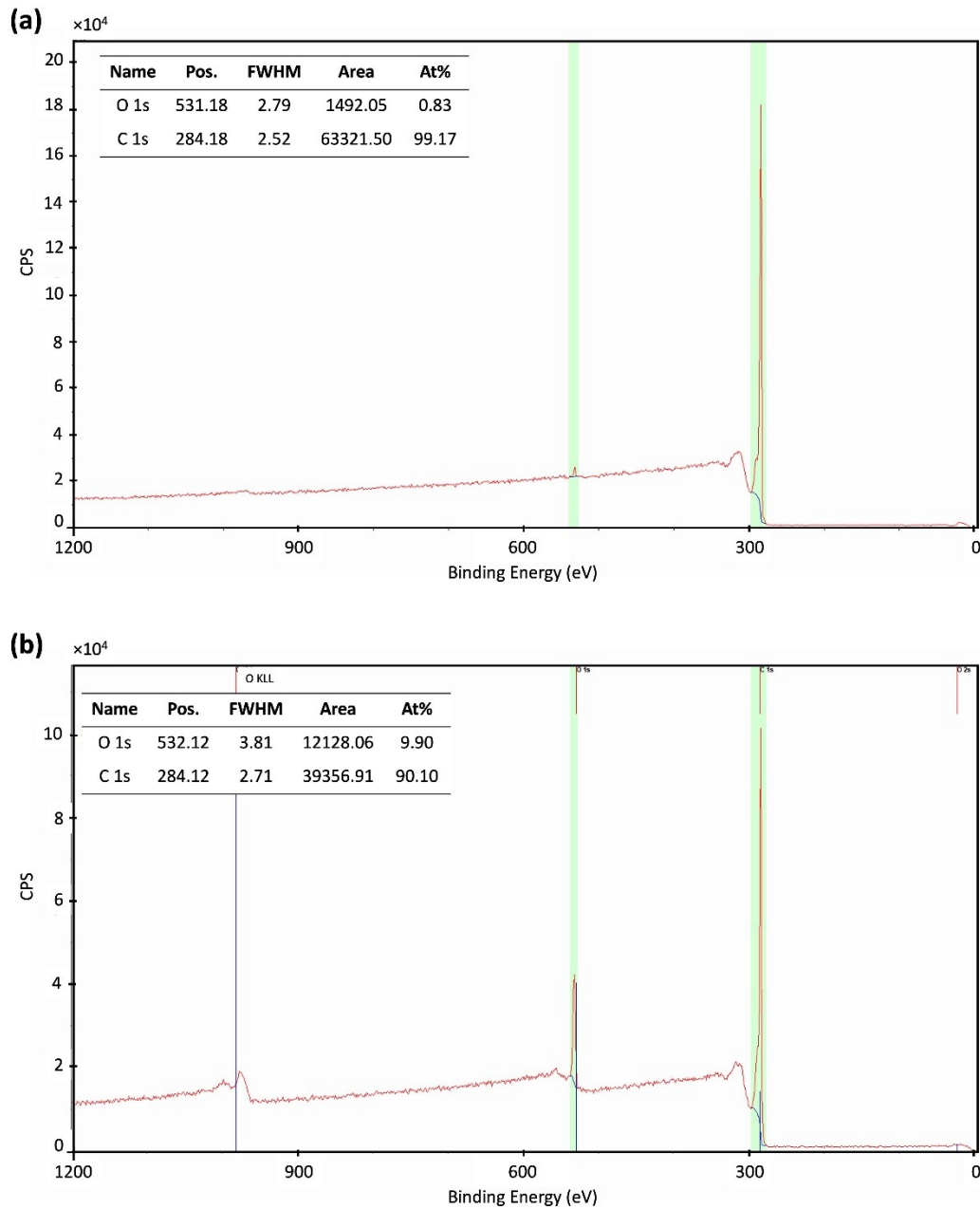
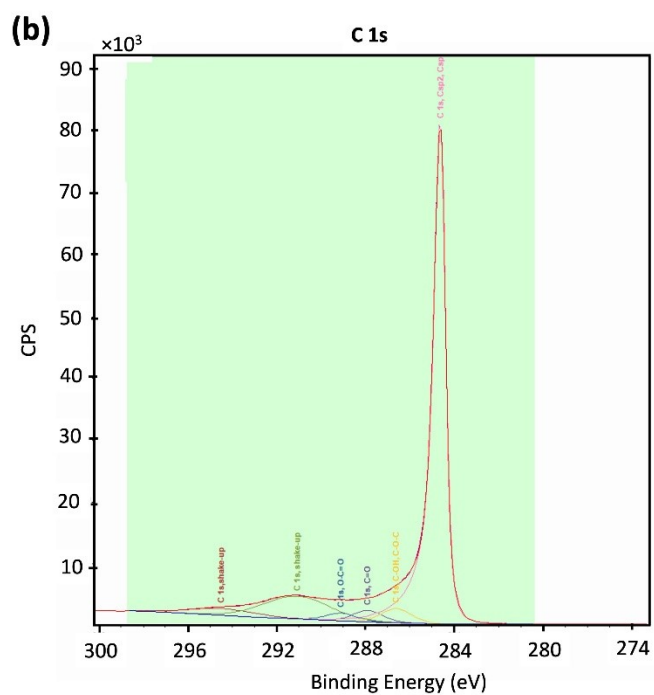
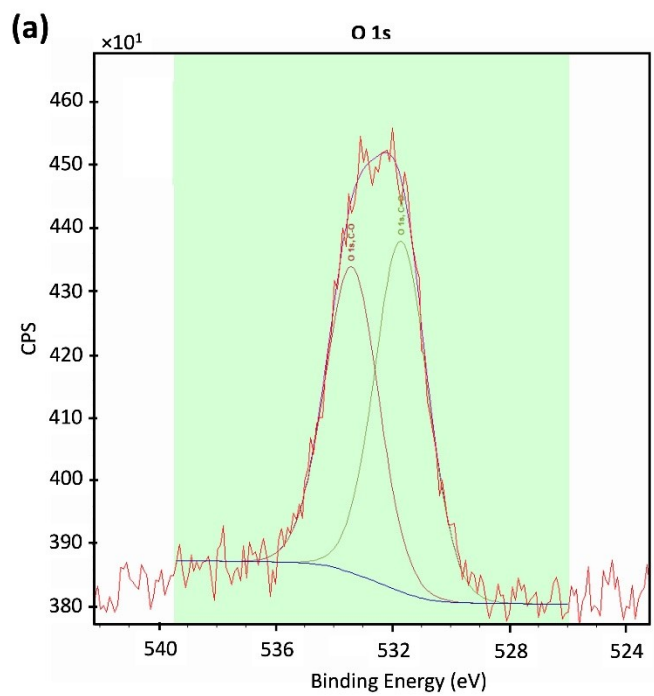


Figure S3. XPS spectra of (a) CMWCNTS, (b) FMWCNTs acquired by Al(mono) (150 W), 160 Energy step 1.000 eV and a total acquired time of 2 mins 0.600 s.



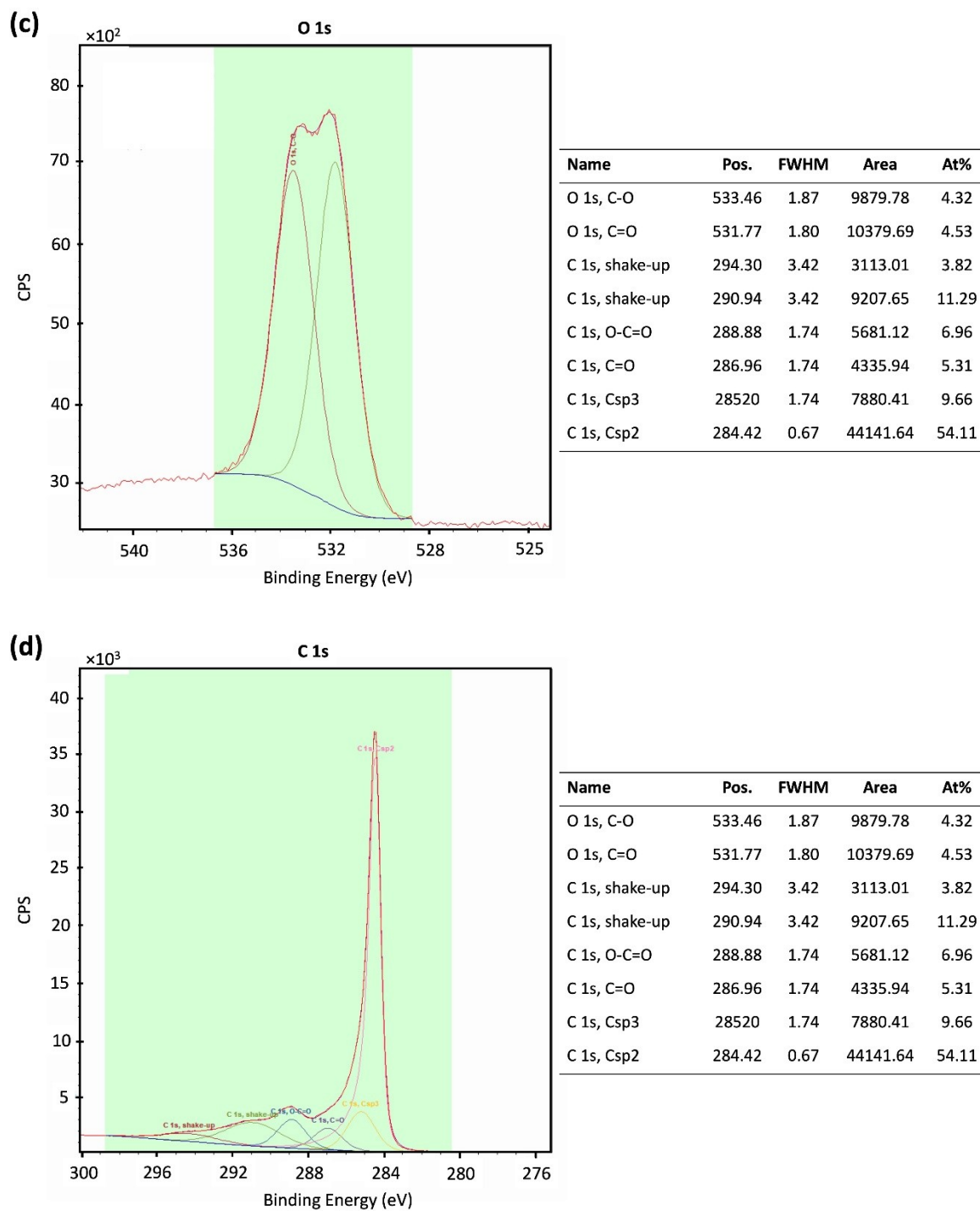


Figure S4. (a) O 1s, (b) C 1s XPS spectra of CMWCNTs, (c) O 1s, (d) C 1s XPS spectra of FMWCNTs acquired by Al(mono) (225W), 20 Energy step 1.00 eV and acquisition time of 12 mins 36.360 s.

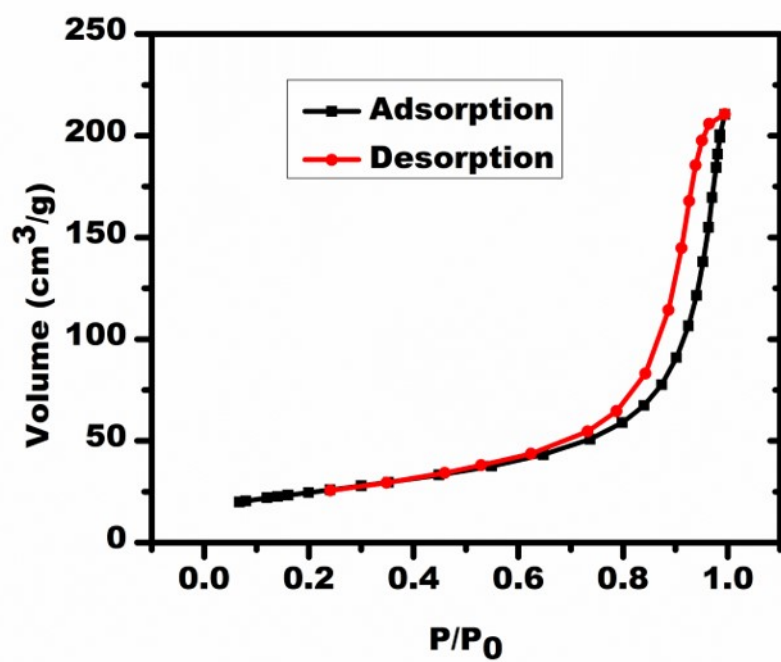


Figure S5. Nitrogen adsorption-desorption of FMWCNTs; yielding surface area of ~87.16 m²/g.



Figure S6. Digital image of FMWCNTs device kept in a 100 mL beaker covering 0.5 cm of bottom of the FMWCNTs device.

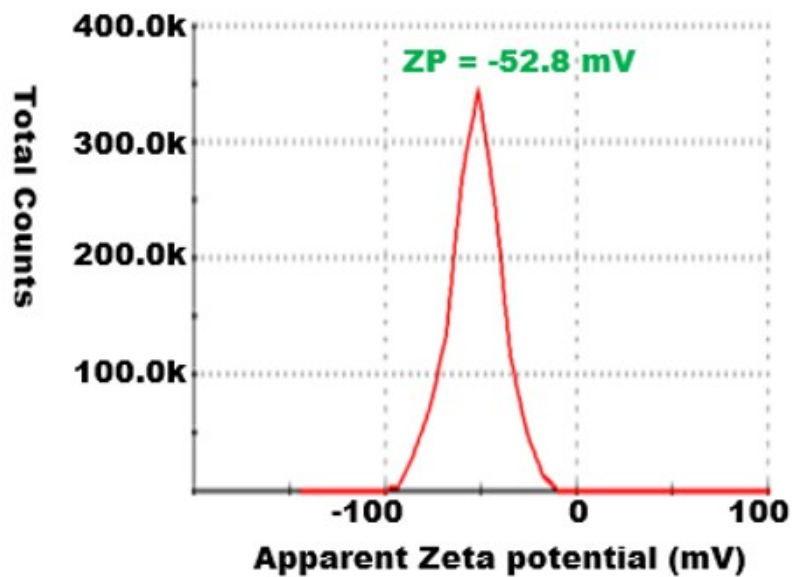


Figure S7. Zeta potential measurement spectra of FMWCNTs.

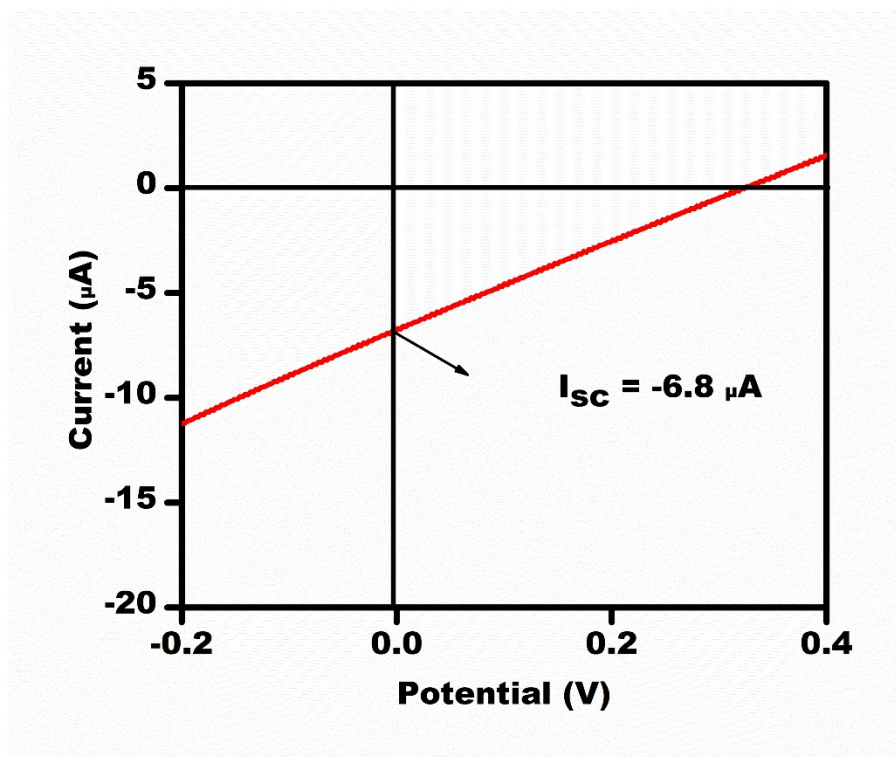


Figure S8. Linear sweep voltammetry measurement of FMWCNTs device in the range of -0.2 V – 0.4 V giving short circuit current at $V_{\text{oc}} = 0$.

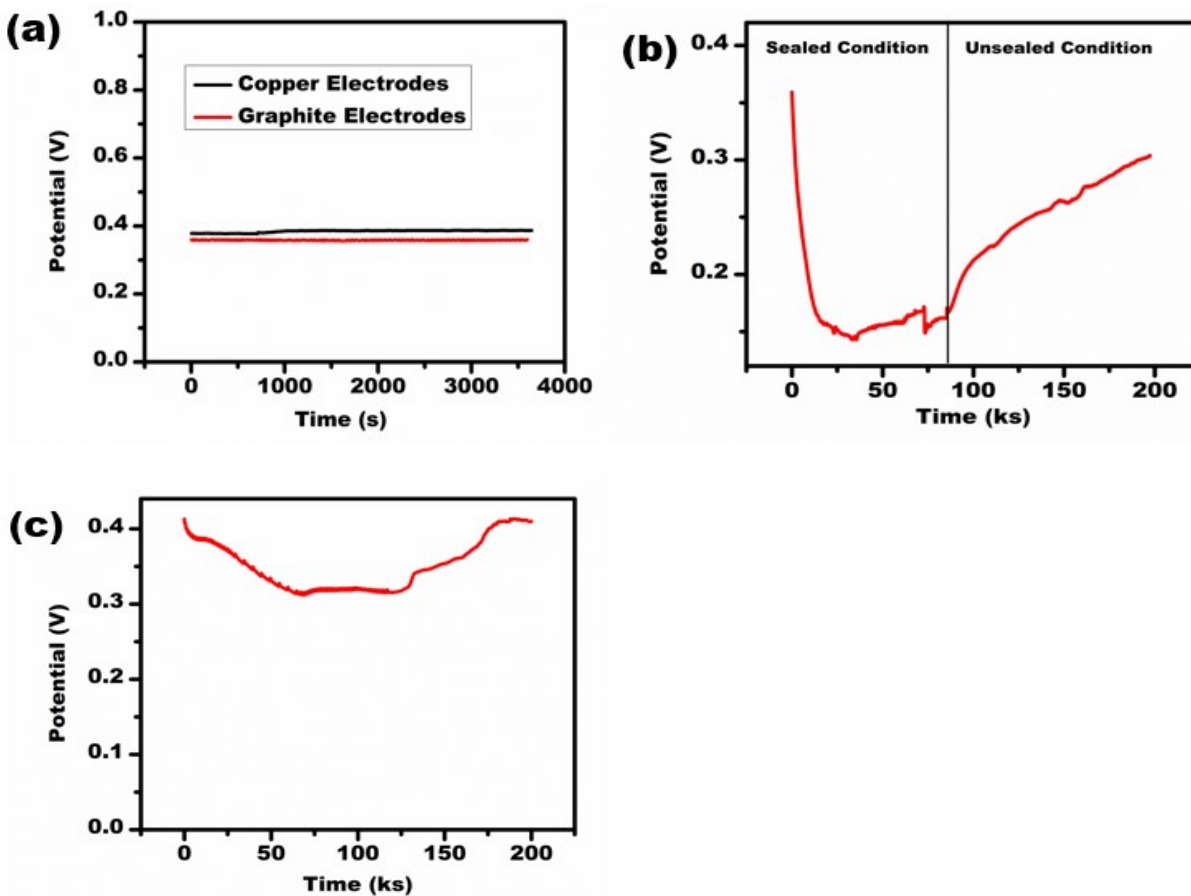


Figure S9. (a) Comparison study of OCP measurement of FMWCNTs device using copper (black line), and graphite (red line) electrodes, (b) FMWCNTs OCP measurement in sealed and unsealed (open) conditions, (c) OCP measurement of FMWCNTs device for 200 ks under ambient conditions.

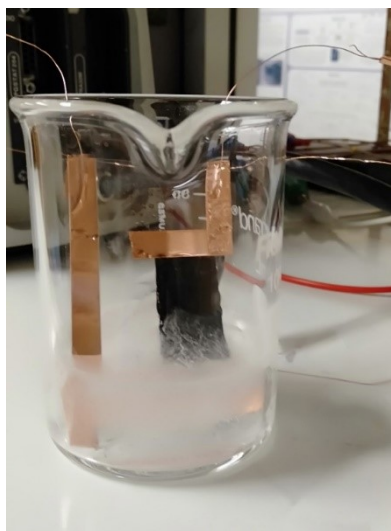


Figure S10. Digital image of FMWCNTs device kept inside the freezer.

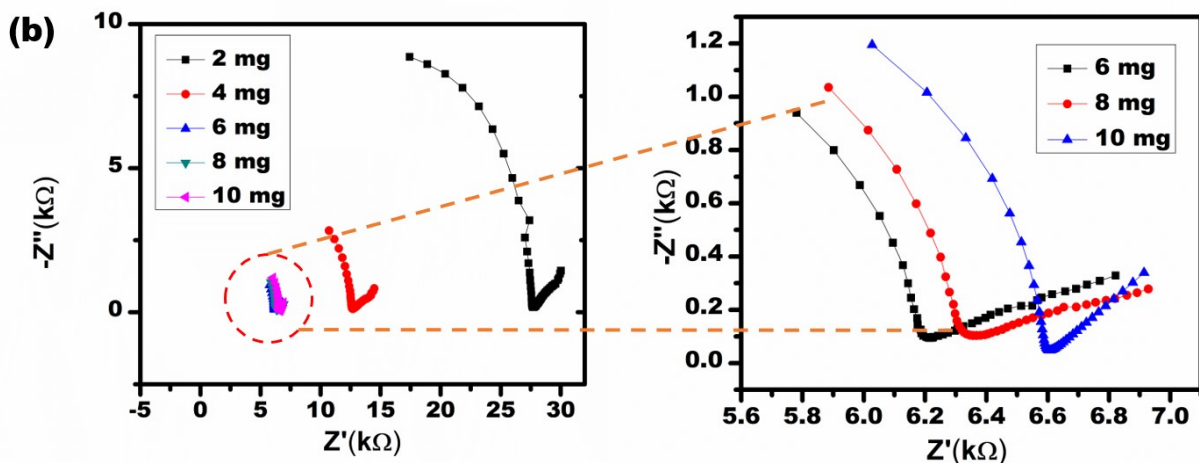
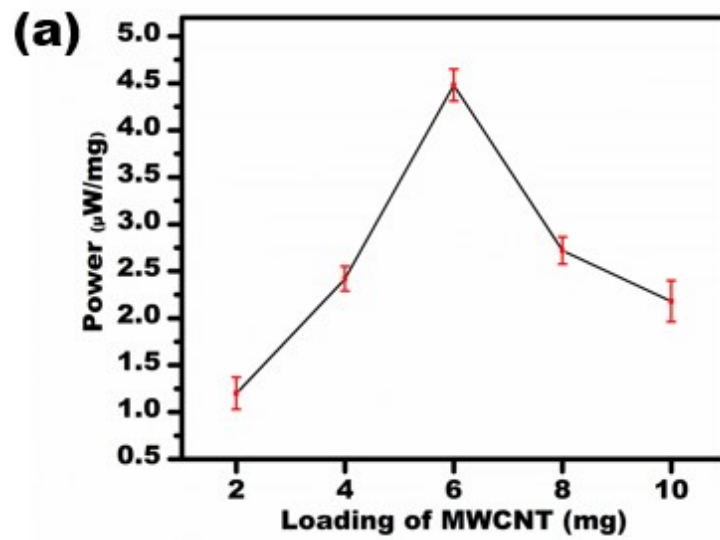


Figure S11. (a) Power measurement of FMWCNTs devices at different loading amounts of FMWCNTs, (b) Nyquist plot of FMWCNTs devices at different loading amounts.

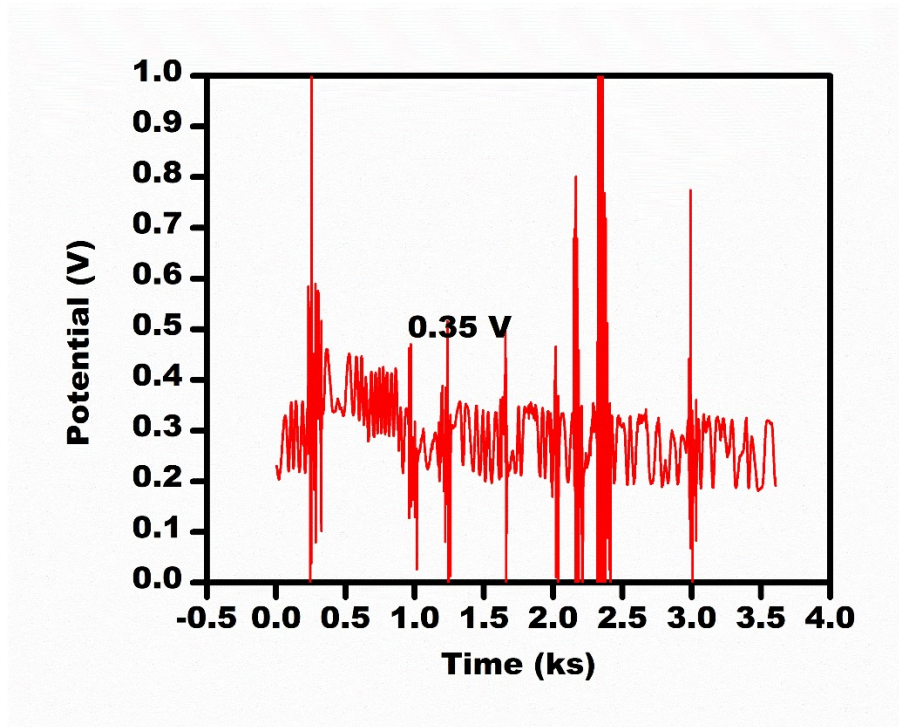


Figure S12. OCP measurement of FMWCNTs device in snow.

Supplementary Table

Table S1: Power generation from different HV devices

Material	Power ($\mu\text{W/g}$)	References
Unprocessed Graphene oxide film	0.0023	DOI: 10.1039/c8ee00671g
Toluene Soot	0.172	DOI: 10.1002/adfm.201700551
Ni-Al LDH	0.18	DOI: 10.1016/j.nanoen.2018.12.042
Aluminium oxide	1.026	DOI: 10.1021/acsami.9b09582
Metal organic framework	3	DOI: 10.1002/adma.202003720
Functionalized CNT	210	This work