Electronic supplementary information

Electrochemical, top-down nanostructured pseudocapacitive electrode for enhanced specific capacitance and cycling efficiency

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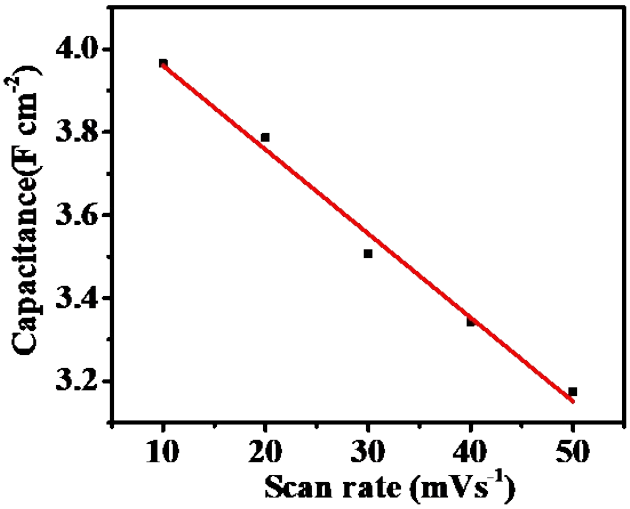

Fig S1. a) Variation of areal capacitance with scan rate.

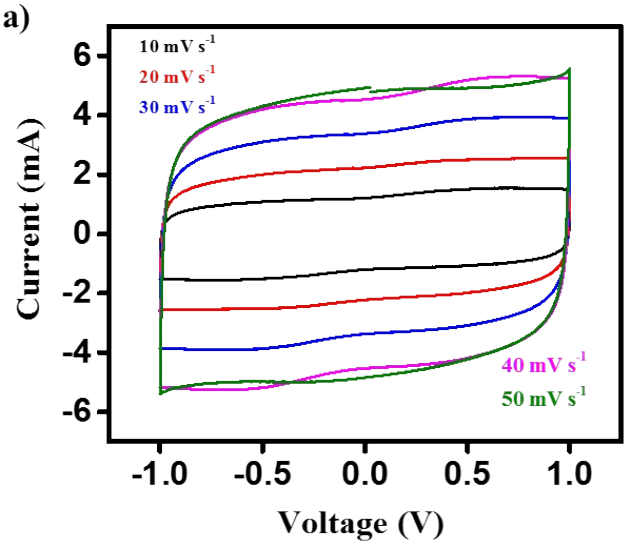

Fig S2. Cycling voltamograms of the CNT bucky paper at different scan rate indicating no pseudocapacitive component.

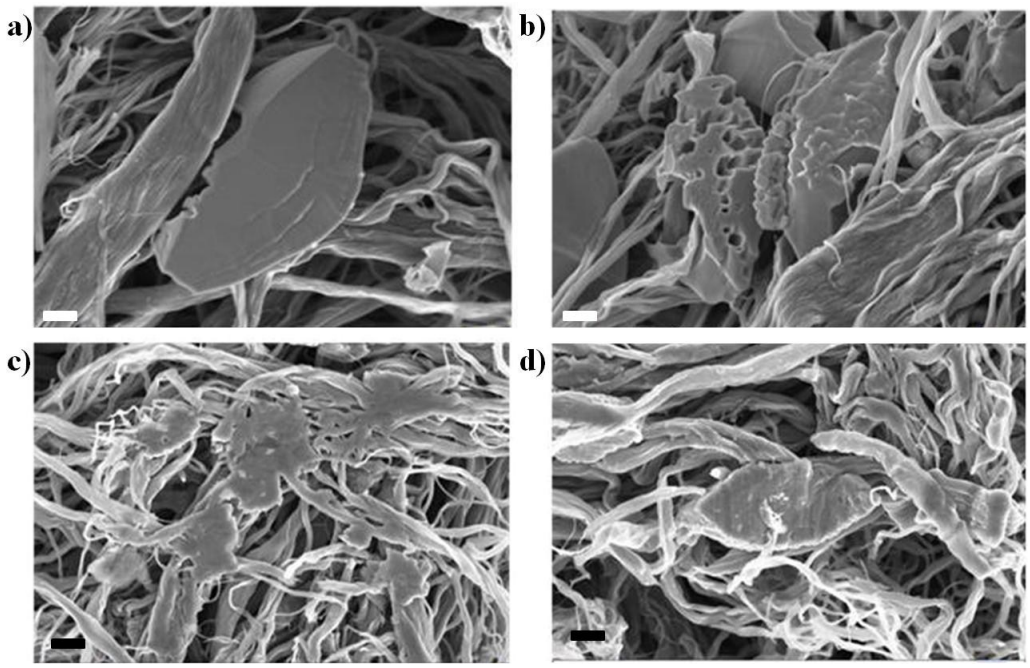

Fig S3. SEM images of CNT/$MnMoO_4$ electrode after (a, b) 100 cycle and (c, d) 500 cycles.

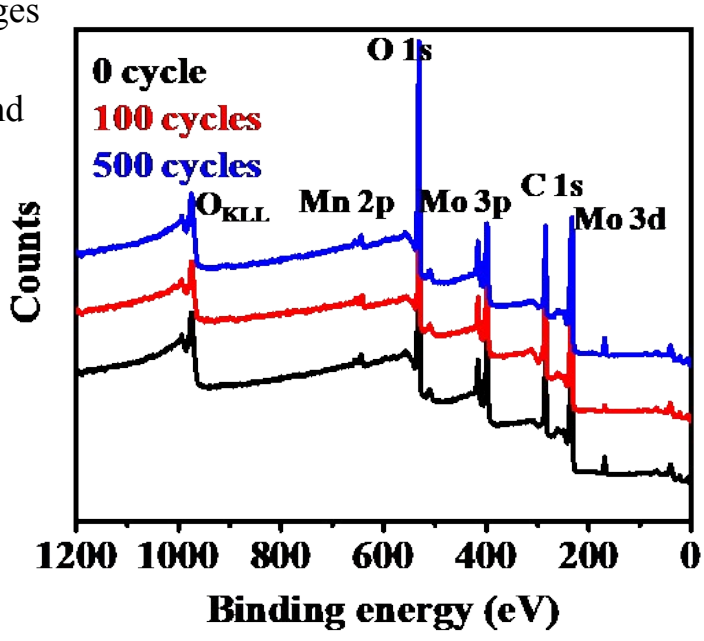

Fig S4. Survey spectrum of CNT/$MnMoO_4$ electrode at different stages of electrochemical cycling.

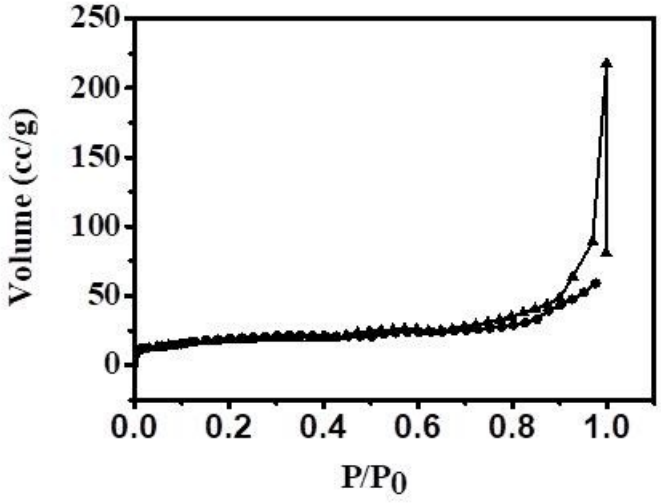

Fig S5. Nitrogen adsorption isotherm for CNT bucky paper.

Table T1: Comparison of surface area parameters for CNT bucky paper and CNT/$MnMoO_4$ electrode at different cycles.

Materials	BET Specific surface area (m^2/g)	Pore volume (cc/g)	% change in SSA	External surface area from *V-t* plots (cc/g.A)
CNT- bucky paper	714	0.33	+ 0 %	3.5
CNT/$MnMoO_4$ (0 cycles)	1086	10.37	+ 52%	2.2
CNT/$MnMoO_4$ (100 cycles)	1337	13.62	+ 87%	1.8
CNT/$MnMoO_4$ (500 cycles)	1726	13.74	+ 142%	2.9

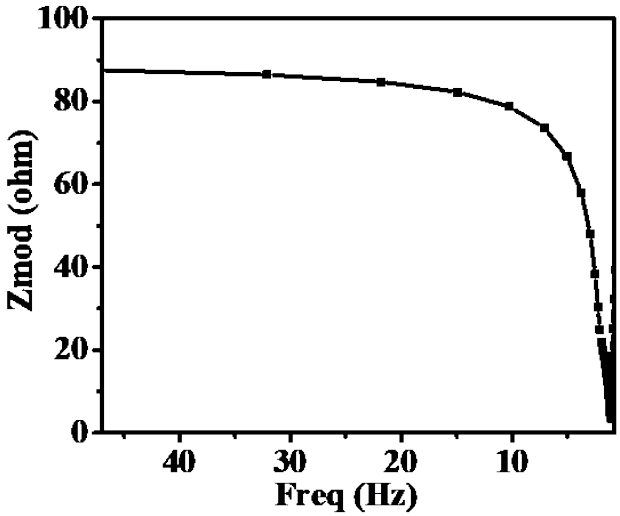

Fig S6. Bode plot indicating the dependence of phase angle on frequency of CNT/$MnMoO_4$ electrode.

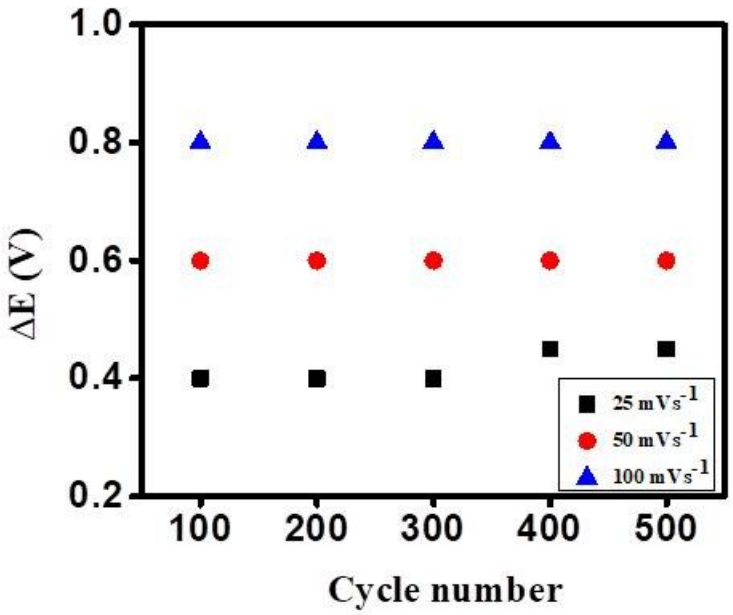

Fig S7. Evidence of mass diffusion during electrochemical cycling of CNT/ $MnMoO_4$ electrode.

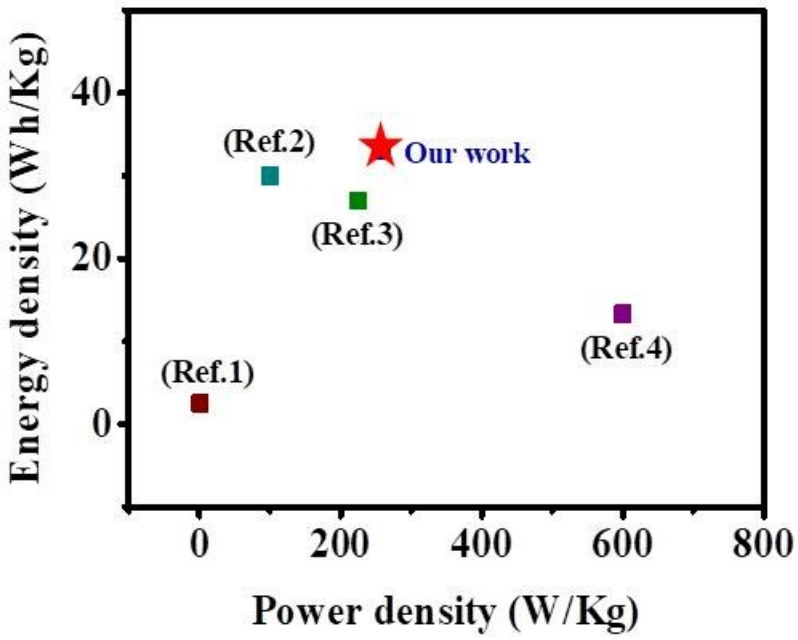

Fig S8. Ragone plot for the comparison of energy and power density with other reports based on MnO_2-CNT hybrid electrode.

References:

1. Y. Zhao, M. P. Li, S. Liu, and M. F. Islam, *ACS Applied Materials & Interfaces,* 2017, 9, **28**, 23810.
2. E. M. Jin, J. G. Lim, and S. M. Jeong, *Journal of Industrial and Engineering Chemistry,* 2017, **54**, 421.
3. D. Gueon and J. H. Moon*, ACS Sustainable Chemistry & Engineering,* 2017, 5, **3**, 2445.
4. L. Li, Z. A. Hu, N. An, Y. Y. Yang, Z. M. Li and H. Y. Wu, *J. Phys. Chem. C,* 2014, **118**, 40, 22865.