Supporting Information

Molecular Interactions Balanced One- and Two-Dimensional Hybrid Nanoarchitectures for High-Performance Supercapacitors

Mingxia Lu^a, Gang Wang^a, Bo Li^a, Jing Chen^a, Jingchao Zhang^b, Zhe Li^c and Bo Hou^d.*

^a College of Chemistry, Chemical and Environmental Engineering, Henan University of Technology, Zhengzhou 450001, P. R. China.

^b Holland Computing Center, University of Nebraska-Lincoln, Lincoln, NE, 68588, USA

^c School of Engineering, Cardiff University, Cardiff, CF24 3AA, UK

^d Engineering Department, University of Cambridge, 9 JJ Thomson Avenue, Cambridge CB3 0FA, UK University of Cambridge, CB3 0FA, Cambridge, UK

* Corresponding author. Tel: +44 (0)1223 748318. Email: bh478@cam.ac.uk (Bo Hou)



Figure S1. Snapshot photos of as-prepared CNT (a), rGO (b) and GO (c) DMF dispersion. SEM images of typical poor dispersed rGO and CNT (d) and well-dispersed rGO and CNT (e) are also provided.



Figure S2. Raman spectra, (a) the full-spectra, (b) D and G-band region

	GO	rGO	GC5:1	GC5:3	GC5:5	Ox-CNTs
G-Band	1599	1591	1583	1588	1593	1589
I _D /I _G	1.14	1.09	0.018	0.034	0.074	0.036
I_{2D}/I_G		0.800	0.101	0.138	0.134	0.123

Table S1. The value of the G-band position, I_D/I_G and I_{2D}/I_G for each sample.



Figure S3. The electrochemical performance of as-prepared supercapacitors with different GC ratio. (a) CV curves at a scan rate of 10 mV·s-1, (b) GCD curve at a current of 5 mA.



Figure S4. (a, b) The CV curves and GCD curves of GC5:5 with different scan rate and current density. (c) Ragone plot of gravimetric energy density versus gravimetric power density of our GC5:5 EDLC in an aqueous electrolyte in comparison with AC¹, HPGC², RGO/PANI³ and RGO@CNTF⁴ based supercapacitors.

References

- 1. Z. Chen, V. Augustyn, J. Wen, Y. Zhang, M. Shen, B. Dunn, and Y. Lu, Advanced Materials, 2011, 23, 791-795.
- 2. D.-W. Wang, F. Li, M. Liu, G. Q. Lu, and H.-M. Cheng, Angewandte Chemmie, 2008, **120**, 379-382.
- J. Zhang, J. Jiang, H. Li, and X. S. Zhao, Energy Environmental Science, 2011, 4, 4009 -4015..
- 4. N. He, O. Yildiz, Q. Pan, J. Zhu, X. Zhang, P. D. Bradford, and W. Gao, Journal of Power Sources, 2017, **343**, 492-501.