Electronic Supplementary Information

Birnessite-type MnO_2 nanosheet arrays with interwoven arrangements on vapor grown carbon fibers as hybrid nanocomposite for pseudocapacitors

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Table S1. Comparative electrochemical performance of synthesized MnO_2@VCFs with previously reported materials using the three-electrode system.

Electrode material	Synthesis method	Electrolyte	Test condition	Specific capacitance	Reference
MnO_2@carbon fiber nanocables	Hydrothermal approach	1 M Na_2SO_4	0.5 A/g	~ 58.28 F/g	[S1]
Cobalt-doped MnO_x thin film	Pulsed laser deposition	1 M Na_2SO_4	5 mV/s	~ 99 F/g	[S2]
MnO_2@carbon fiber paper	Redox-reaction mediated method	1 M Na_2SO_4	0.5 A/g	~ 106.4 F/g	[S3]
Au-MnO_2/CNT coaxial arrays	Electrodeposition/ infiltration/CVD	0.1 M Na_2SO_4	10 mV/s	~ 68 F/g	[S4]
MnO_2@wood derived biochar composite	Pyrolysis/oven growth method	1 M Na_2SO_4	0.5 A/g	~ 81 F/g	[S5]
MnO_2@carbonaceous aerogel	Hydrothermal process	6 M KOH	0.5 A/g	~ 106.4 F/g	[S6]
rGO@MnO_2 composite	Redox-reaction mediated method	1 M Na_2SO_4	10 mV/s	~ 101 F/g	[S7]
MnO_2@VCFs	Wet-chemical approach	1 M Na_2SO_4	0.5 A/g	~ 115.3 F/g	This work

References:

S1. D. Zhang, Y. Zhang, Y. Luo and P. K. Chu, Nano Energy, 2015, 13, 47-57.

S2. D. Yang, J. Power Sources, 2012, 198, 416-422.

S3. Y. Luo, J. Jiang, W. Zhou, H. Yang, J. Luo, X. Qi, H. Zhang, D. Y. W. Yu, C. M. Li and T. Yu, J. Mater. Chem., 2012, 22, 8634-8640.

S4. A. L. M. Reddy, M. M. Shaijumon, S. R. Gowda and P. M. Ajayan, J. Phys. Chem. C, 2010, 114, 658-663.

S5. C. Wan, Y. Jiao and J. Li, RSC Adv., 2016, 6, 64811-64817.

S6. Y. Ren, Q. Xu, J. Zhang, H. Yang, B. Wang, D. Yang, J. Hu and Z. Liu, Acs. Appl. Mater. Interfaces., 2014, 6, 9689-9697.

S7. S.-W. Lee, S.-M. Bak, C.-W. Lee, C. Jaye, D. A. Fischer, B.-K. Kim, X.-Q. Yang, K.-W. Nam and K.-B. Kim, J. Phys. Chem. C, 2014, 118, 2834-2843.