Electronic Supplementary Material

Facile synthesis of well-ordered manganese oxide nanosheet arrays on carbon cloth for high-capacitance supercapacitors

Di Guo, Xinzhi Yu, Wei Shi, Yazi Luo, Qiuhong Li*, Taihong Wang*

Key Laboratory for Micro-Nano Optoelectronic Devices of Ministry of Education, and State Key Laboratory for Chemo/Biosensing and Chemometrics, Hunan University, Changsha, 410082, P. R. China.

**E-mail:liqiuhong2004@hotmail.com (Q. H. Li); thwang@iphy.ac.cn (T. H. Wang); Tel.: +86 0731 88664019; Fax: +86 0731 88822137.*

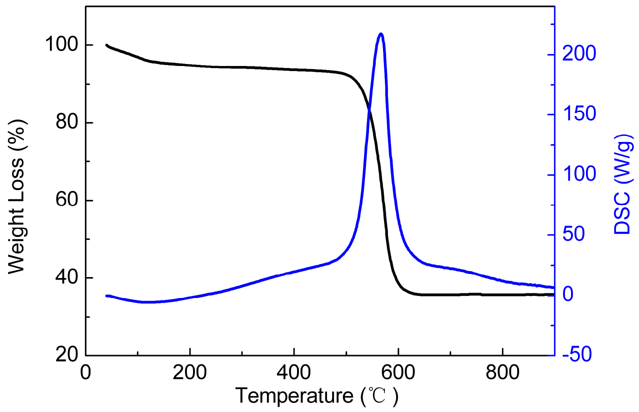

Fig. S1 TGA-DSC curves for the MnO_2 NSAs.

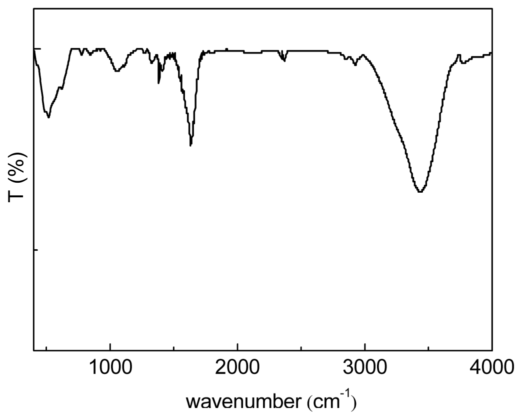

Fig. S2 FT-IR spectra of as-synthesized MnO_2 NSAs.

TGA-DSC curves have further demonstrated to quantify the carbon amount in the material (Fig. S2). The total weight loss of sample is 64% and the weight becomes stable above 600□. The FT-IR spectrum is presented in Fig. S2. Two absorption bands observed at 600 and 480 cm^{-1} are corresponded to the characteristic stretching collision of O-Mn-O, which demonstrated the presence of the MnO_2 in the sample. The peaks detected at 1100 and 1,652 cm^{-1} symbolized the stretching collision of C-O and C=O from the surface of carbon cloth, respectively. The typical broad absorption in the wavelength ranges (3200-3500 cm^{-1}) are allocated hydroxyl absorption of H-O-H.

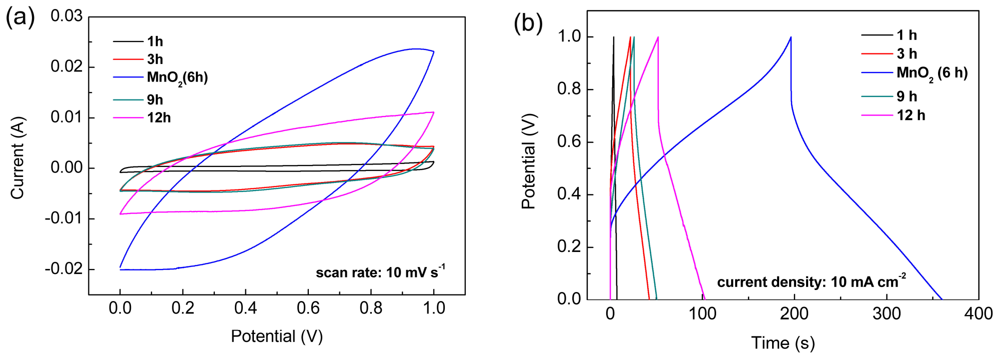

Fig. S3 (a) Electrochemical performances of MnO_2 obtained at 180□ at different times: 1 h, 3 h, 6 h, 9 h and 12 h. (a) CV curves at 10 mV s^{-1}. (b) Galvanostatic charge/discharge curves at a current density of 10 mA cm^{-2}.

Electrode materials	Specific capacitance	Current density/ Scan rate	Reference
whisker-like MnO_2 arrays	274.1 F g^{-1}	0.1 A g^{-1}	30
three-dimensionally ordered macroporous MnO_2	765 F g^{-1} 518 F g^{-1}	2 mV s^{-1} 2.5 A g^{-1}	31
α-MnO_2 nanorods	245 F g^{-1}	1 A g^{-1}	32
amorphous nanostructured MnO_2	250 F g^{-1}	0.5 mA cm^{-2} (0.8 A g^{-1})	34
MnO_2 nanosheet	425 F g^{-1}	0.13 mA cm^{-2}	40
polyaniline-MnO_2 coaxial nanofiber	383 F g^{-1}	0.5 A g^{-1}	43
MnO_2-coated carbon nanotubes	193 F g^{-1}	0.2 A g^{-1}	44
graphene and nanostructured MnO_2 composite	245 F g^{-1}	1 mA cm^{-2}	45
MnO_2 nanosheet arrays grown on carbon cloth	1.67 F cm^{-2}	10 mA cm^{-2}	our work

Table 1 Summarization of the supercapacitor performance of different MnO_2 nanomaterials.