Electronic Supplementary Material (ESI) for Nanoscale.

Supplementary information for

"Few-layer MoS_2 Nanosheets/Nitrogen-doped Graphene 3D Aerogel as a High Performance and Long-term Stability Supercapacitor Electrode"

by

Yue Yuan, Haipeng Lv, Qunjie Xu , Haimei Liu,

Yonggang Wang

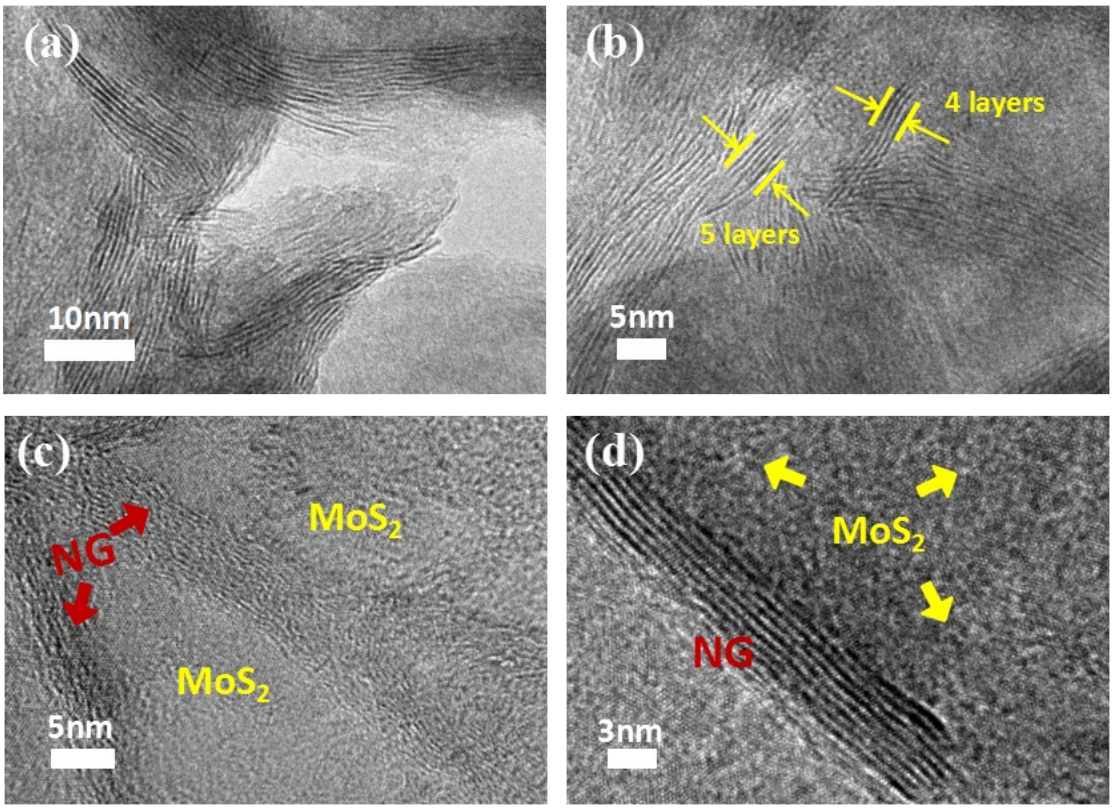

Figure S1 TEM images of (a,b) MoS_2-NS and (c,d) 3D MoS_2/N-GAs.

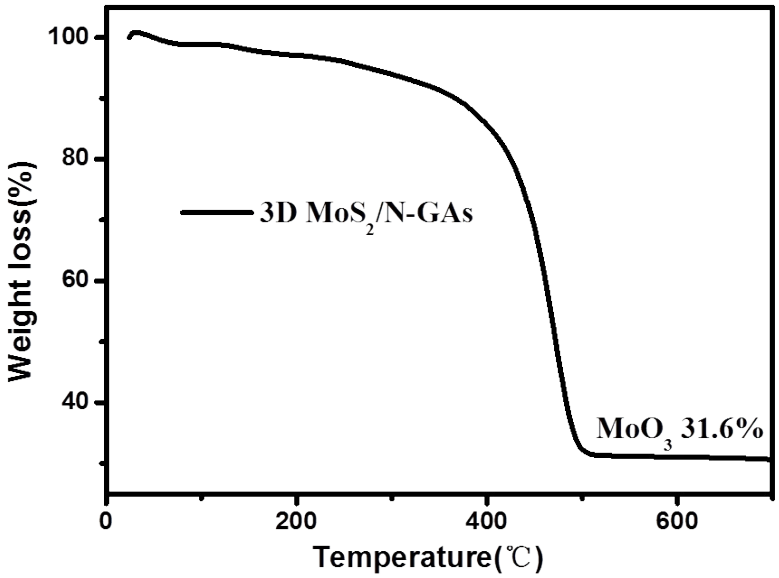

Figure S2 TGA curves of 3D MoS_2/N-GAs.

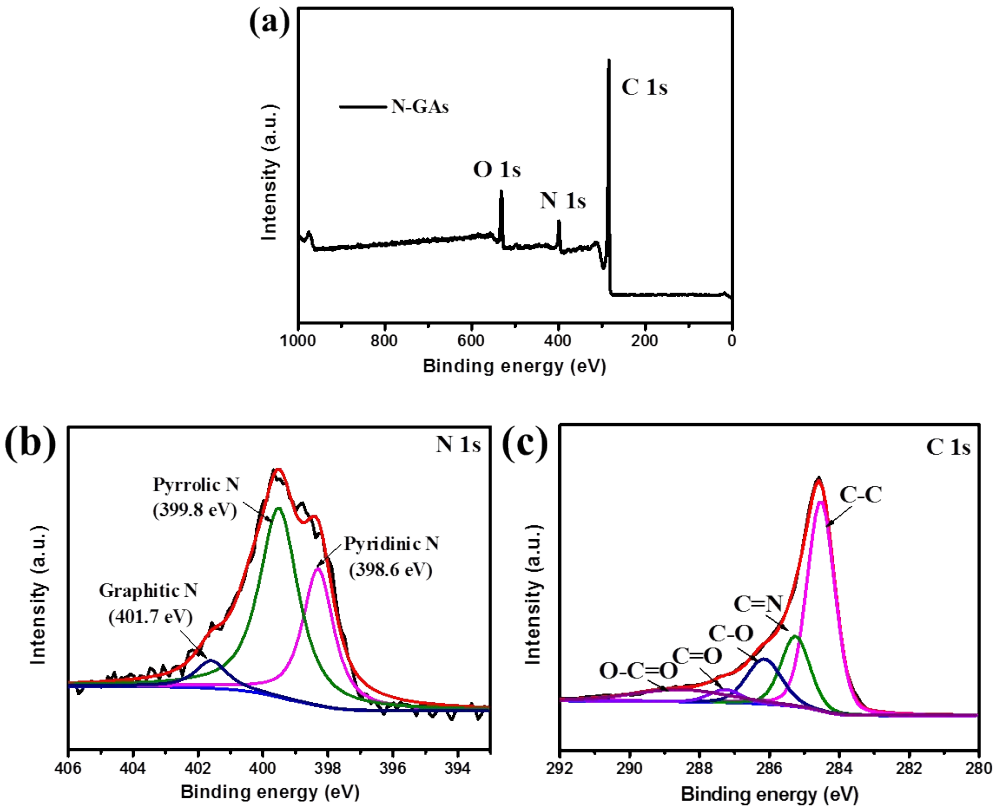

Fig. S3 (a) The survey XPS spectra; (b) N 1s and (c) C 1s for N-GA.

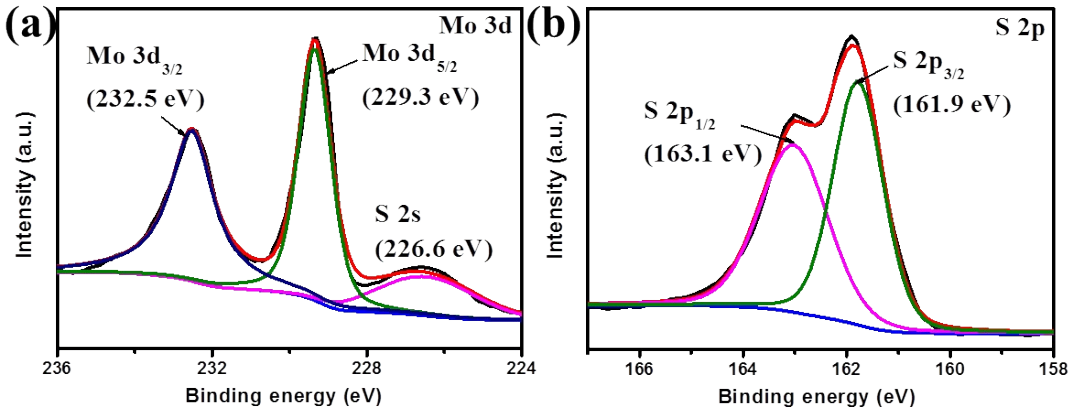

Figure S4 (a) Mo 3d and (b) S 2p XPS spectra for MoS_2-NS.

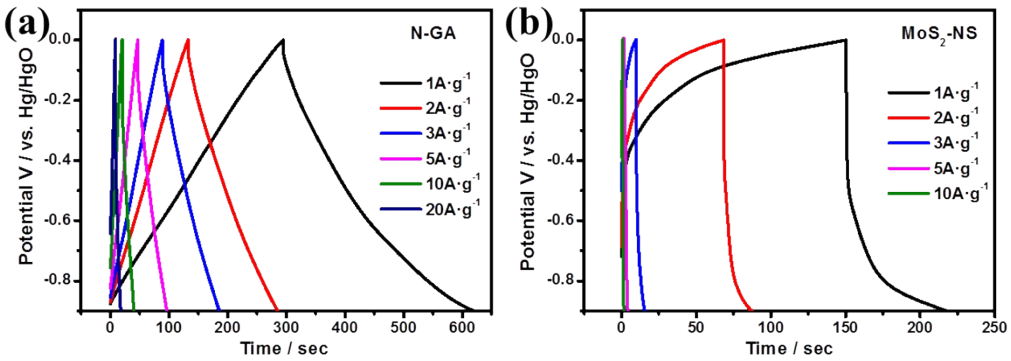

Figure S5 GCD curves of N-GA and MoS_2-NS at different current density.

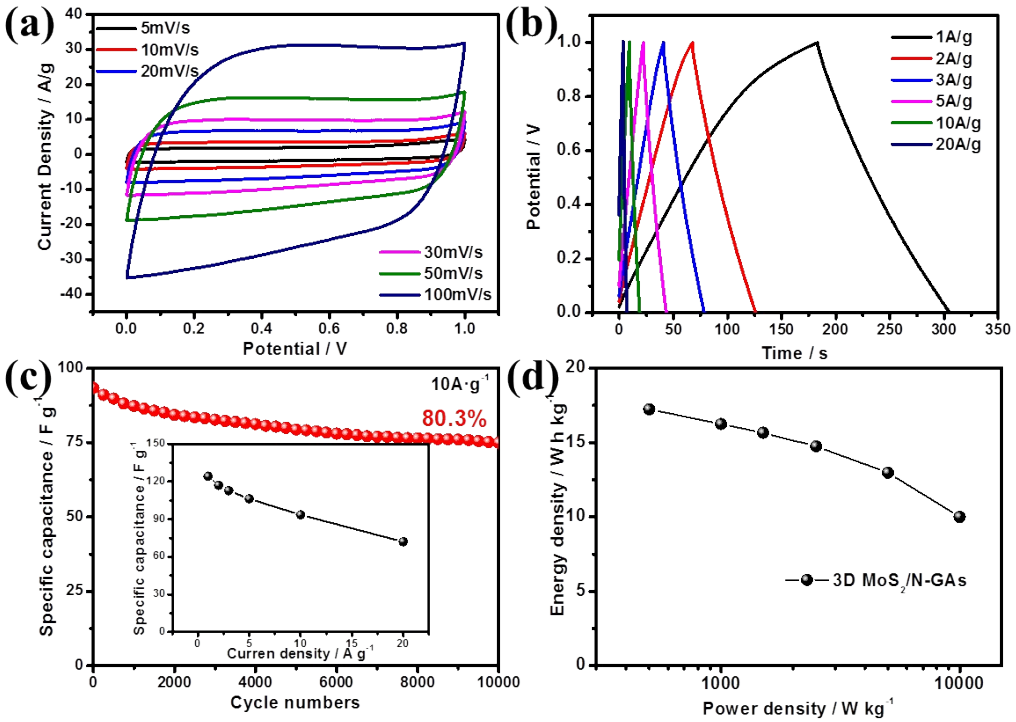

Figure S6 Electrochemical performance of symmetric supercapaciors measured in a two electrode system. (a) CV curves at different scan rates from 5 to 200 mV s^{-1}; (b) GCD curves at different current densities from 1 to 20 A g^{-1}; (c) Cycling stability measured at a current density of 10 A g^{-1} for 10,000 cycles, the inset showing the specific capacitances at different current densities from 1 to 20 A g^{-1}; (d) Ragone plot related to energy density and power density.

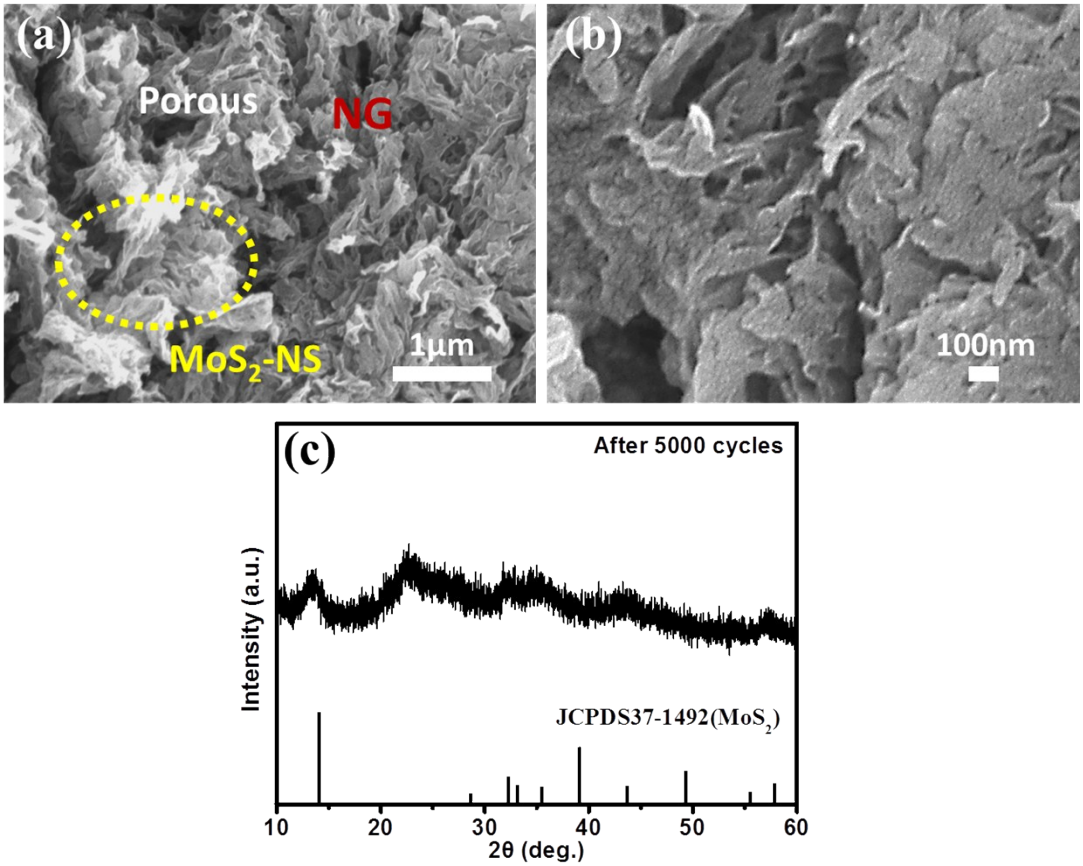

Figure S7 (a, b) SEM images and (c) XRD patterns of 3D MoS_2/N-GAs after 5000 cycles.

Table S1
Specific capacitance (F g^{-1}) of the three samples at different current density.

Sample	Current Density (A g^{-1})					
	1	2	3	5	10	20
3D MoS_2/N-GAs	532	508	492	469.8	425	388
N-GA	350	321	298	272	236	198
MoS_2-NS	80.9	64	57.4	49	38	-

Table S2 Comparison of electrochemical performance of different MoS_2/carbon based nanocomposites materials

Electrodes	Specific capacity (F g^{-1})	Cycling stability	Capacitance retention (%)	Reference
MoS_2/N-doped graphene aerogel	**532 F g^{-1} at 1 A g^{-1}**	**10000**	**93.6%**	**This work**
MoS_2/Graphene	265 F g^{-1} at 10 mV s^{-1}	1000	92%	S1
MoS_2/Graphene	243 F g^{-1} at 1 A g^{-1}	1000	92.3%	S2
ACFTs/ MoS_2	308.5 F g^{-1} at 5 mVs^{-1}	6000	97.38%	S3
C/MoS_2	210 F g^{-1} at 1 A g^{-1}	1000	105%	S4
MoS_2/N-doped Graphene	245 F g^{-1} at 0.25 A g^{-1}	1000	91.3%	S5

MoS_2 /MWCNT	452.7 F g^{-1} at 1 A g^{-1}	1000	91%	S6

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S2. K. Huang, L. Wang, Y. Liu, Y. Liu, H. Wang, T. Gan and L. Wang, *Int. J. Hydrog. Energy*, 2013, **38**, 14027-14034.

S3. L. Gao, X. Li, X. Li, J. Cheng, B. Wang, Z. Wang and C. Li, *Rsc Adv*. 2016, **6**, 57190-57198.

S4. B. Hu, X. Qin, A. M. Asiri, K. A. Alamry, A. O. Al-Youbi and X. Sun, *Electrochim. Acta*, 2013, **100**, 24-28.

S5. B. Xie, Y. Chen, M. Yu, T. Sun, L. Lu, T. Xie, Y. Zhang and Y. Wu, *Carbon*, 2016, **99**, 35-42.

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