Electronic Supplementary Material (ESI) for Sustainable Energy & Fuels.

Supporting Information

Unveiling the potential of nanosheet-based $NiTe_2$@MnTe hollow nanospheres in hybrid supercapacitor technology

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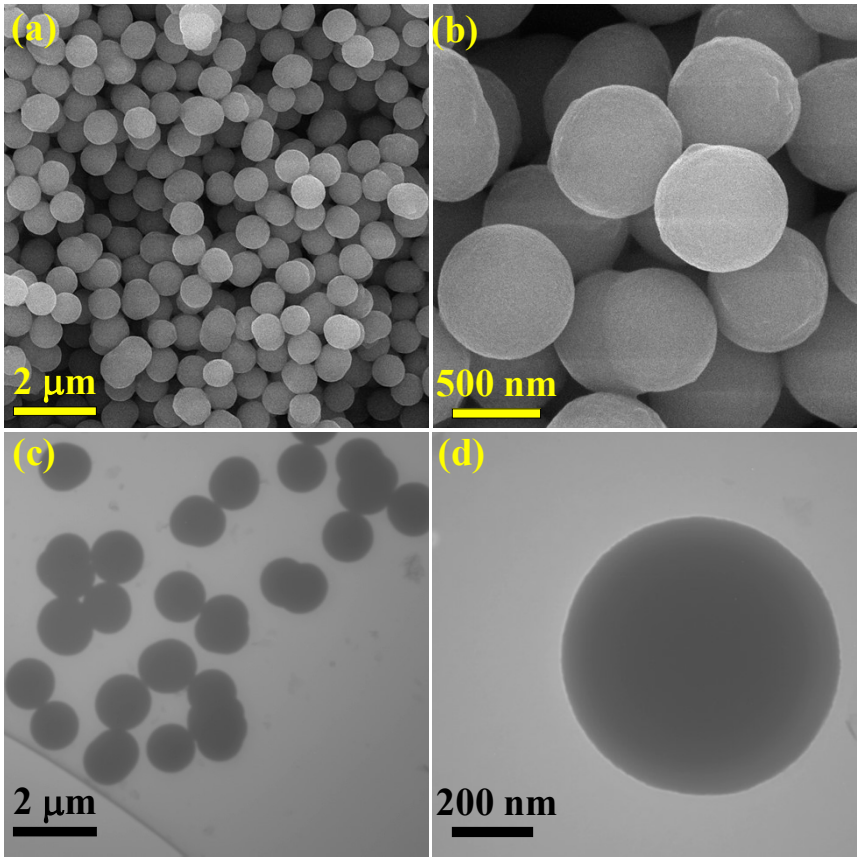

Fig. S1 (a, b) FE-SEM images of the NiMOF. (c, d) TEM images of the NiMOF.

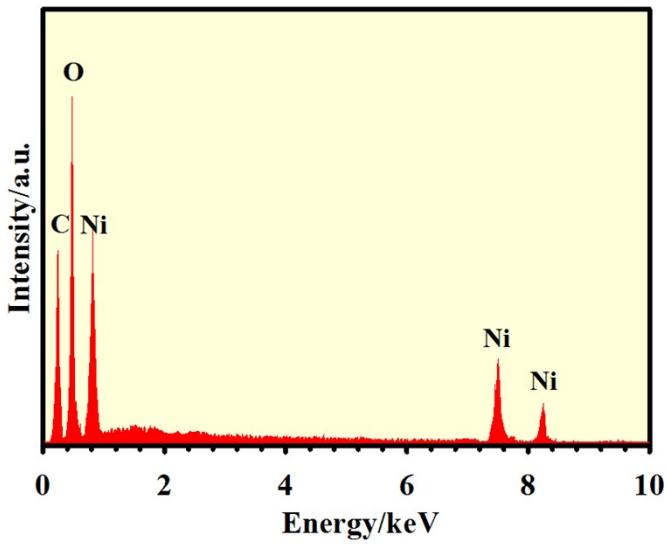

Fig. S2 EDX pattern of the NiMOF.

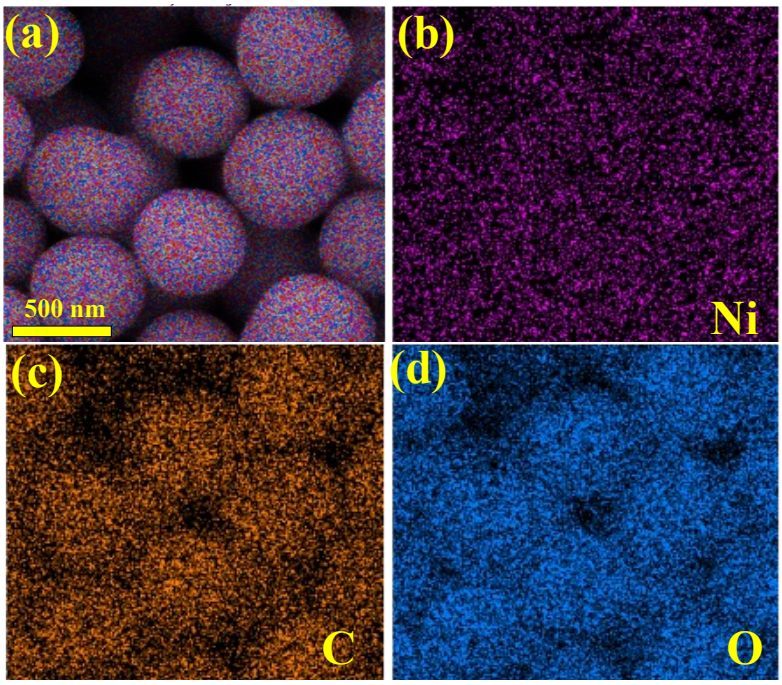

Fig. S3 FE-SEM mapping images of the NiMOF.

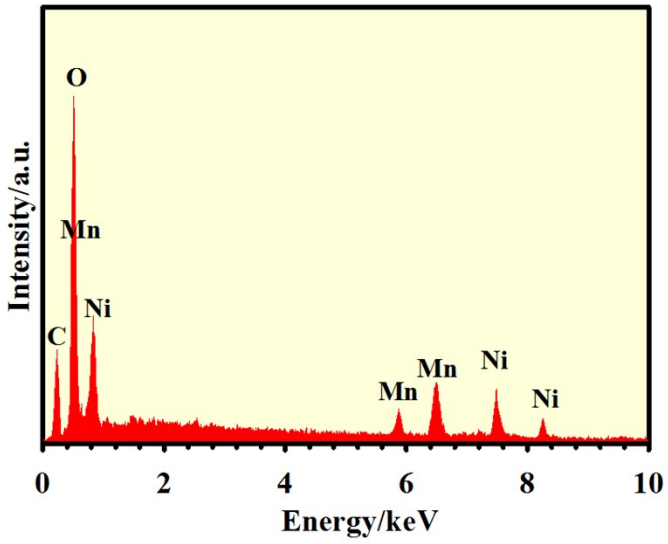

Fig. S4 EDX pattern of the NiMnLDH10.

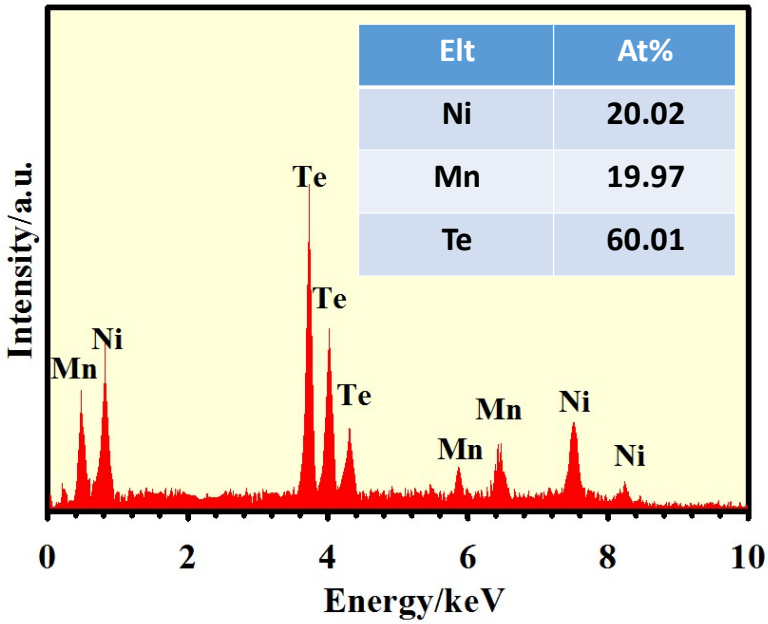

Fig. S5 EDX pattern of the NMT-HS.

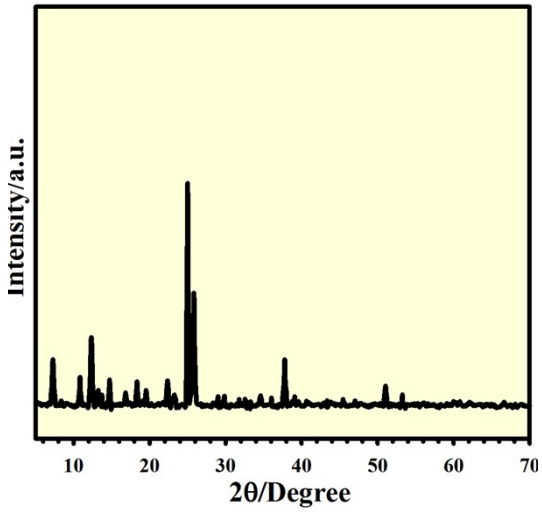

Fig. S6 XRD pattern of the NiMOF.

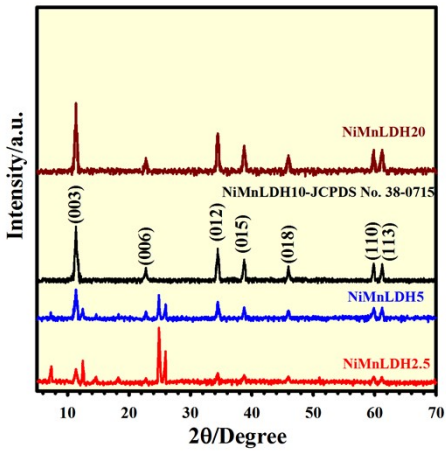

Fig. S7 XRD patterns of the NiMnLDH samples.

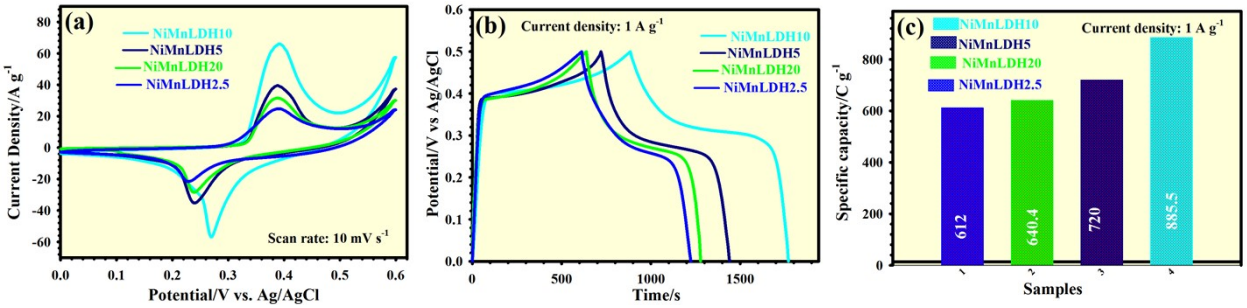

Fig. S8 (a) CV curves of the LDHs-based electrodes at 10 mV s^{-1}. (b) GCD curves of the LDHs-based electrodes at 1 A g^{-1}. (c) Specific capacities of the LDHs-based electrodes at 1 A g^{-1}.

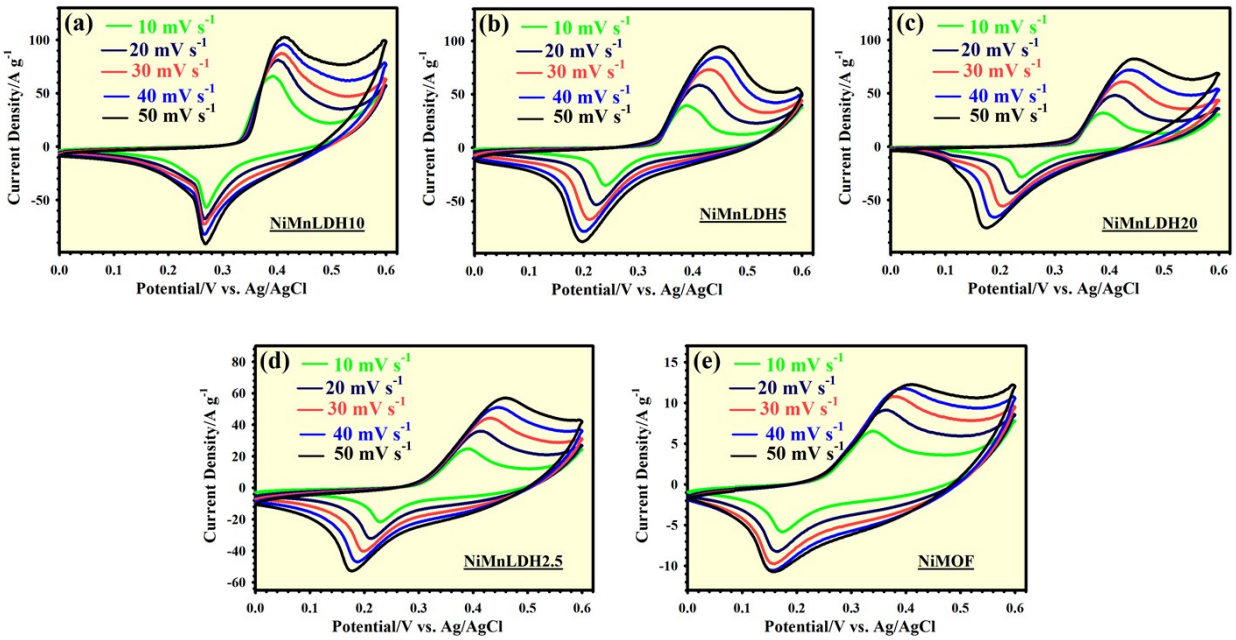

Fig. S9 CV curves of the LDHs and NiMOF electrodes at various scan rates from 10 to 50 mV s^{-1}.

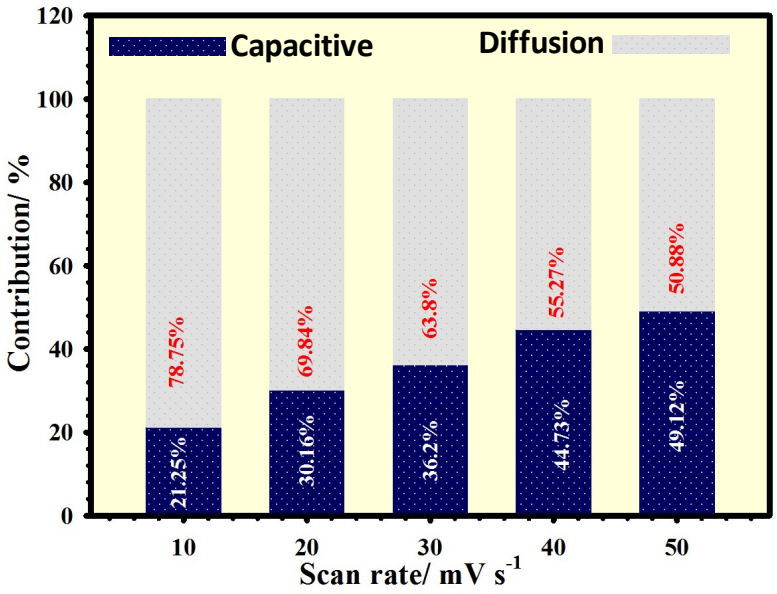

Fig. S10 Relative contribution of the capacitive and diffusion-controlled charge storage at various sweep speeds for NMT-HS sample.

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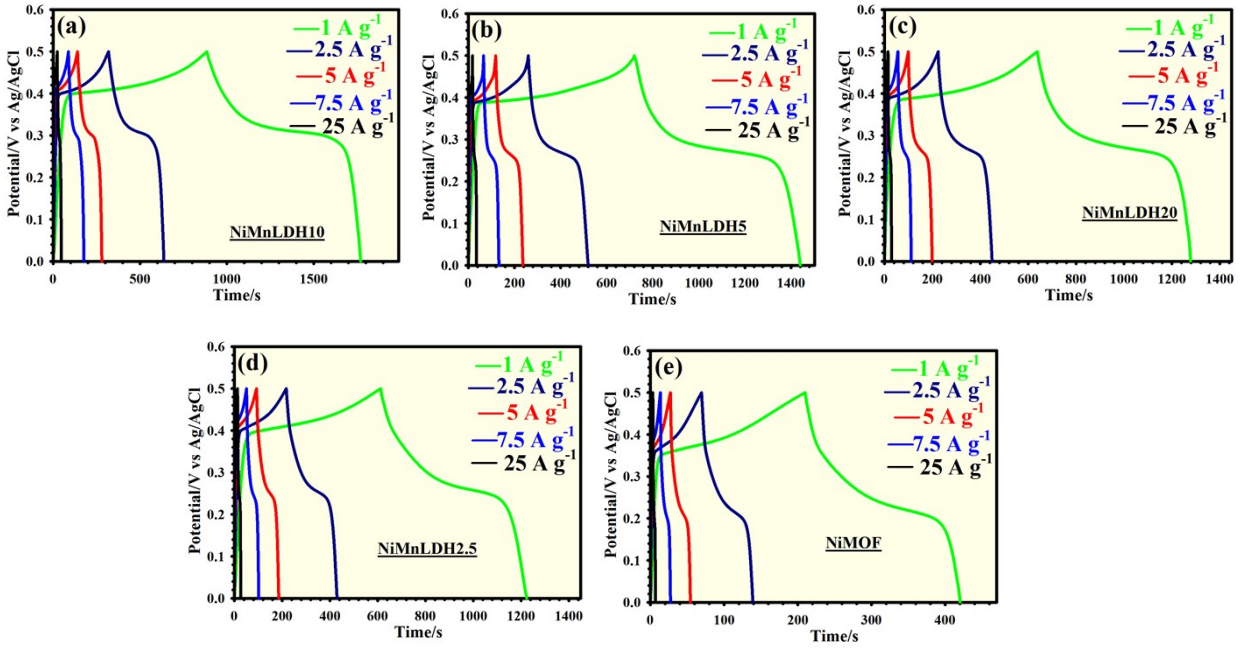

Fig. S11 GCD curves of the LDHs and NiMOF electrodes at various current densities from 1 to 25 A g^{-1}.

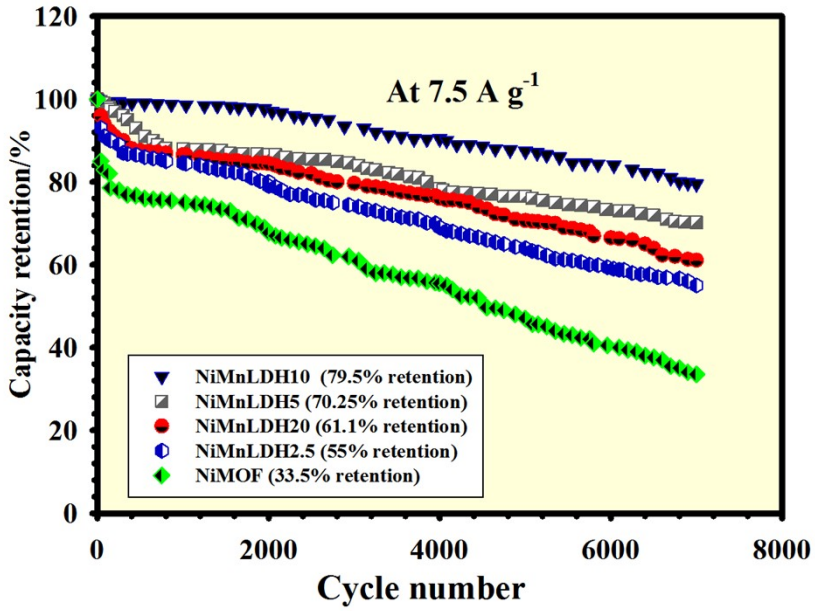

Fig. S12 Longevity of the LDHs and NiMOF electrodes at 7.5 A g^{-1}.

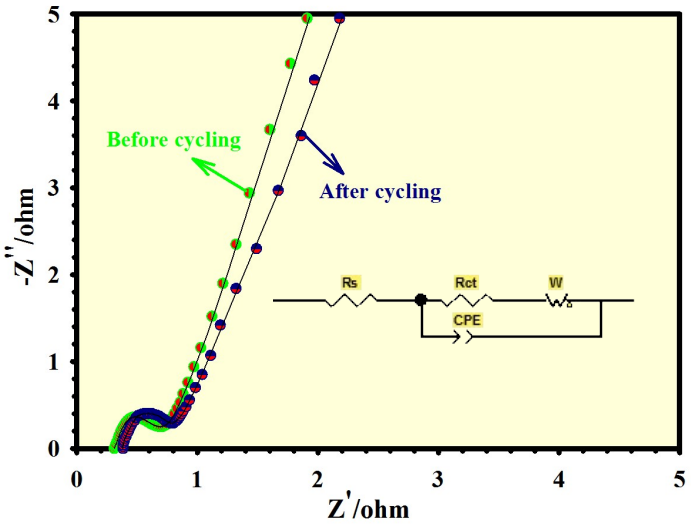

Fig. S13 EIS curves of the NMT-HS electrode before and after 7000 cycles.

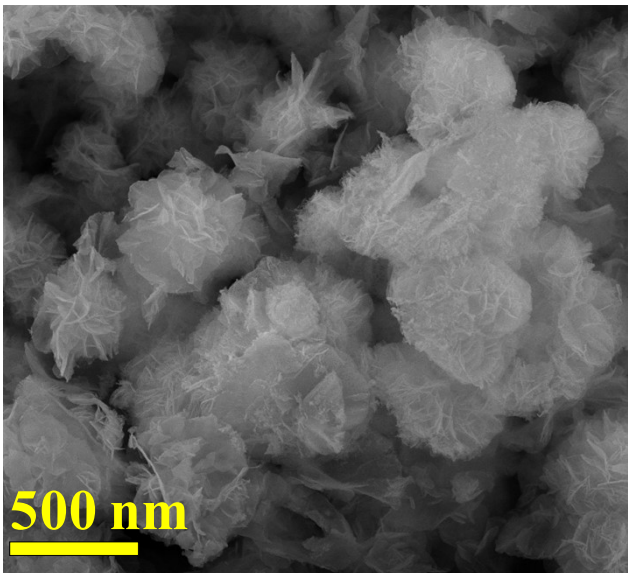

Fig. S14 FE-SEM image of the NMT-HS after 7000 cycles.

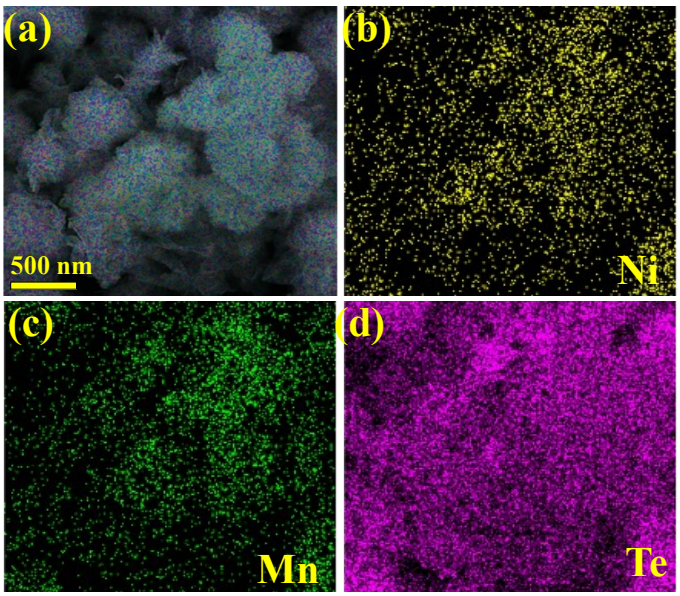

Fig. S15 FE-SEM image of the NMT-HS after 7000 cycles.

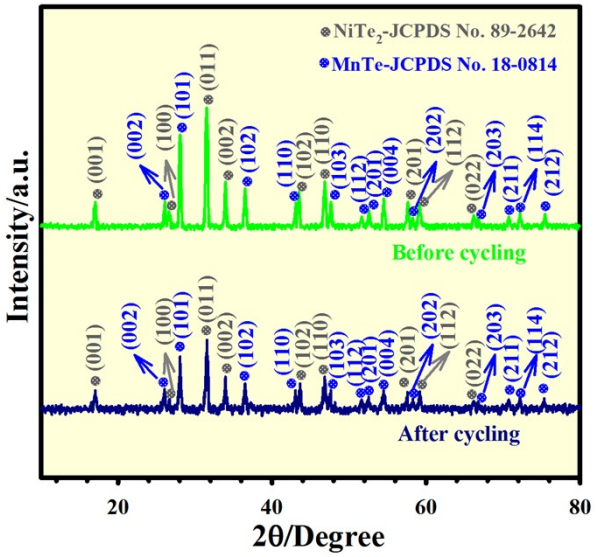

Fig. S16 XRD pattern of the NMT-HS before and after 7000 GCD cycles.

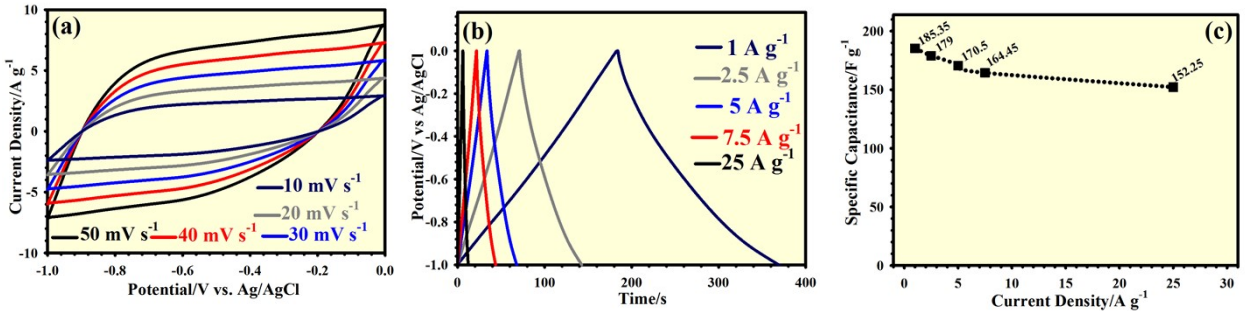

Fig. S17 (a) CV plots of the AC at various scan rates from 10 to 50 mV s^{-1}. (b) GCD plots of the AC at various current densities from 1 to 25 A g^{-1}. (c) Rate capability of the AC electrode.

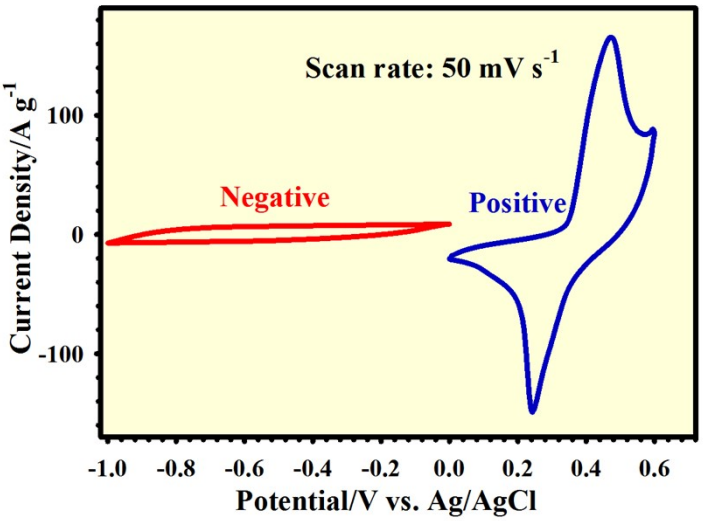

Fig S. 18 CV plots of AC (negative electrode) and NMT-HS (positive electrode) at 50 mV s^{-1} in three-electrode cell.

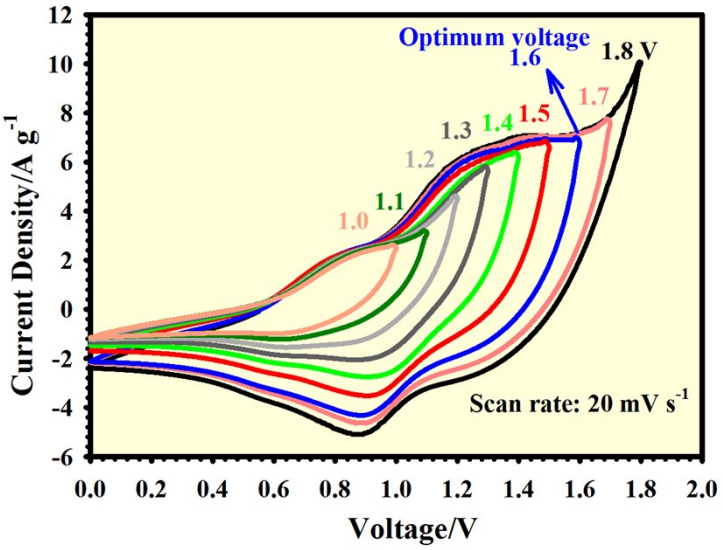

Fig. S19 CV plots of the (+)NMT-HS||(-)AC at various potential window at 20 mV s^{-1} from 1.0 to 1.8 V.

Table S1. Comparison of the supercapacitive performance of the NMT-HS with other previously reported materials.

Composition	Capacity (C/g)	Cycles, retention	Rate capability	ED (Wh kg^{-1})	Reference
CNTs/Ni–Co–S-3	734 at 1 A g^{-1}	1000, 88.46%	68% at 20 A g^{-1}	42.1	1
$CoSe_2$@rGO	856 at 1 A g^{-1}	5000, 95%	76% at 20 A g^{-1}	53	2
NiS_2	813 at 1 A g^{-1}	5000, 93%	70% at 20 A g^{-1}	39.8	3
rGO-CCSe	724 at 1 A g^{-1}	6000, 91.5%	71% at 60 A g^{-1}	57.8	4
Co_9S_8	926 at 1 A g^{-1}	8000, 86%	67.4% at 15 A g^{-1}	25.49	5
Co_3S_4/g-C_3N_4-10	415 at 0.5 A g^{-1}	5000, 75.6%	54.5% at 10 A g^{-1}	37.7	6
$CoSe_2$/rGO	757 at 1 A g^{-1}	5000, 92%	51.61% at 50 A g^{-1}	50.2	7
Ni–Co–P/POx/C	583 at 1 A g^{-1}	5000, 77.3%	62.7% at 30 A g^{-1}	37.59	8
NMT-HS	1325.5 at 1 A g^{-1}	7000, 91.85(3 E)	78.15% at 25A g^{-1}	62.3	This work

References

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