Supporting Information

Engineering of Hierarchical $NiCoSe_2$@NiMn-LDH Core-Shell Nanostructures as a High-Performance Positive Electrode Material for Hybrid Supercapacitors

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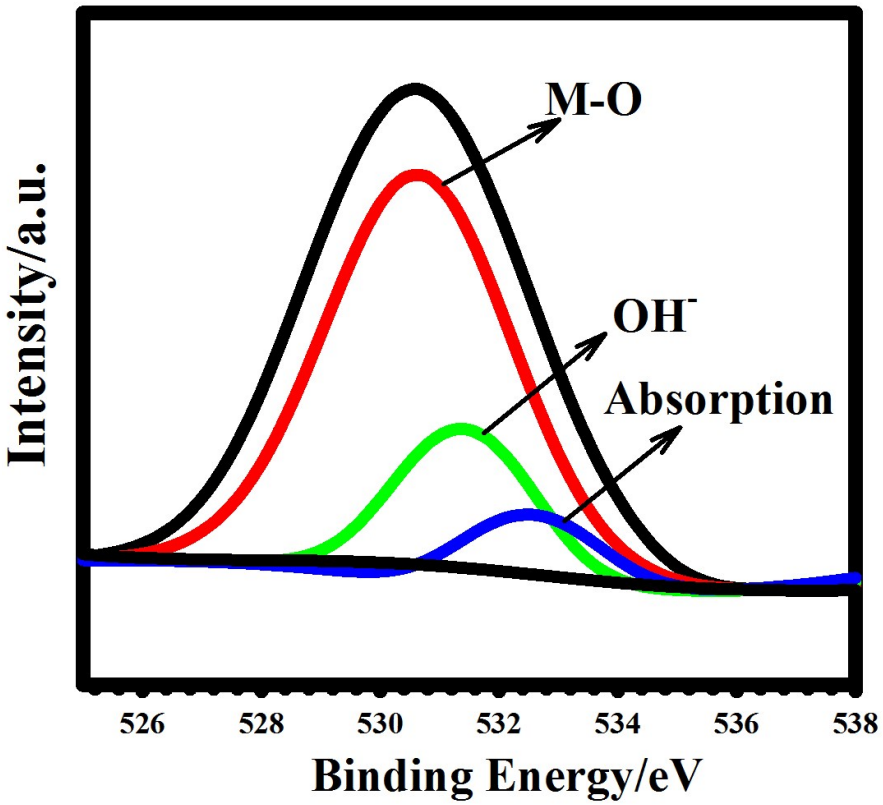

Fig. S1 XPS spectrum of the O 1s for NCSe@NMLDH sample.

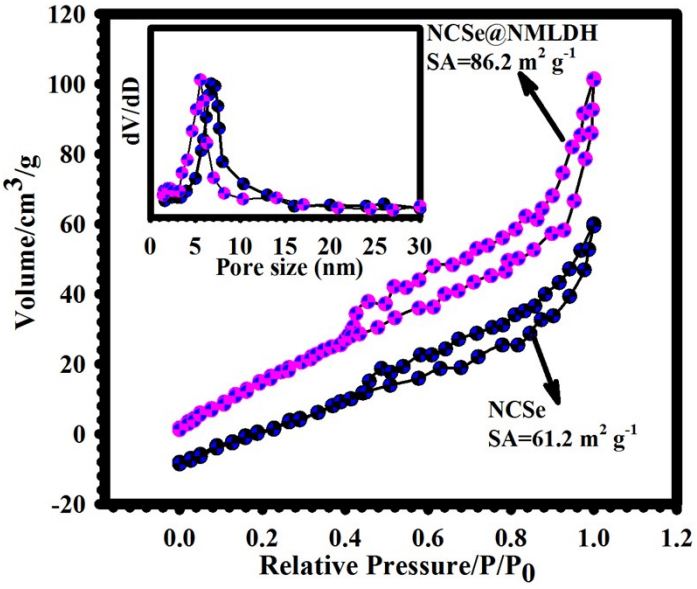

Fig. S2 BET curves of NCSe and NCSe@NMLDH and their corresponding BJH curve (inset).

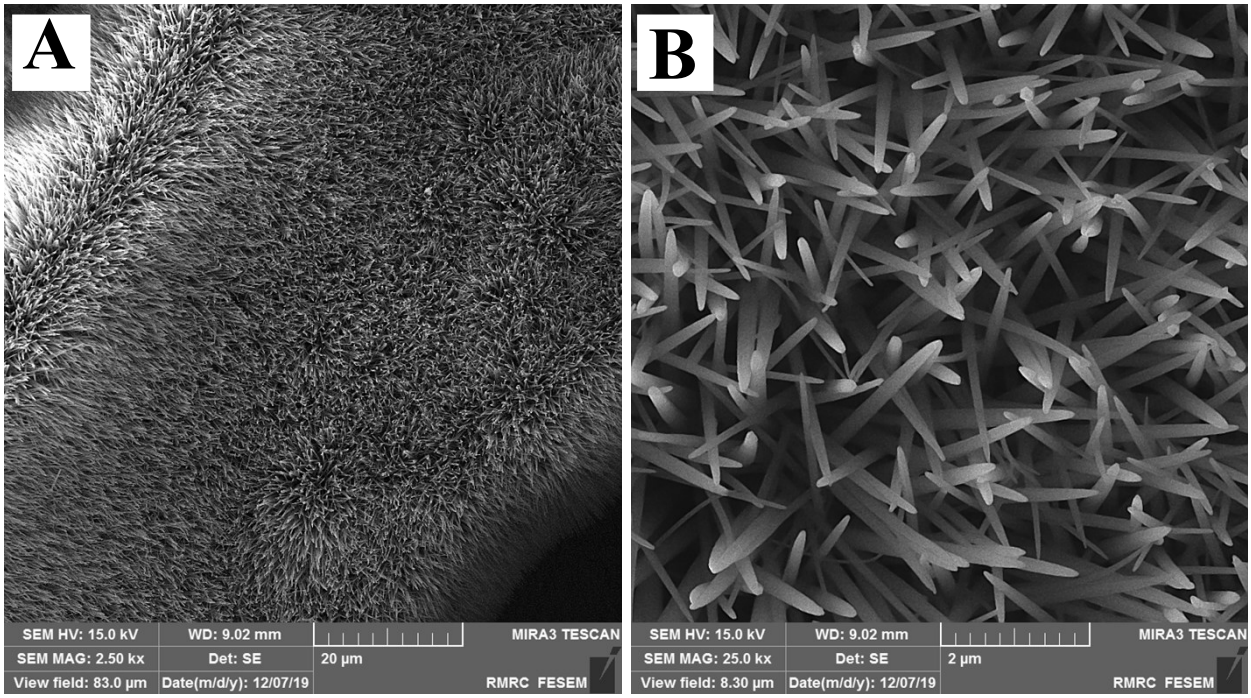

Fig. S3 (A, B) FE-SEM image of the Ni-Co-precursors.

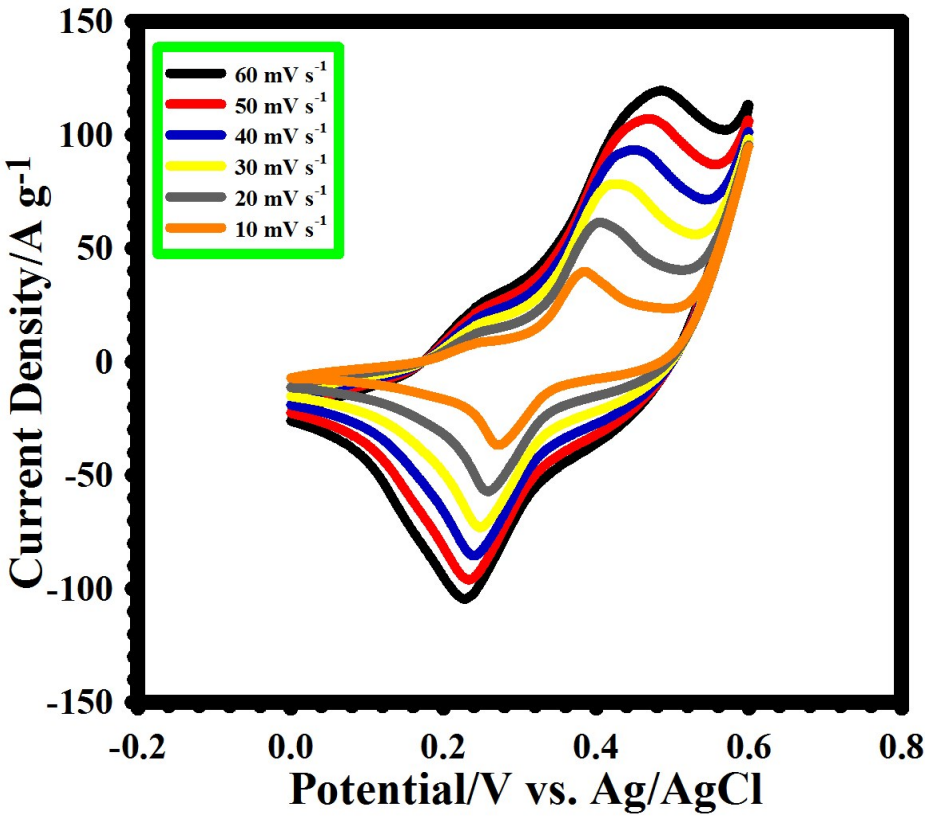

Fig .S4 CV curves of the NCSe/NF electrode at various scan rates.

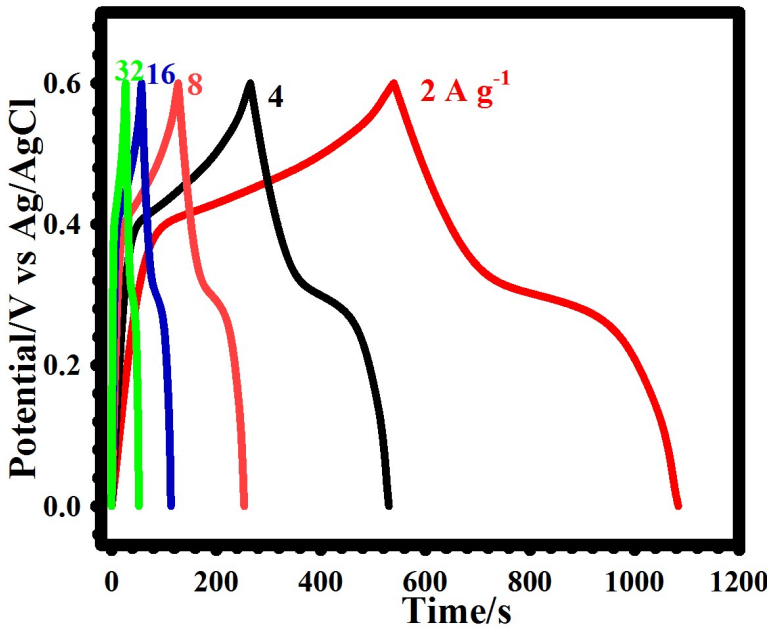

Fig. S5 GCD curves of the NCSe/NF electrode at various current densities.

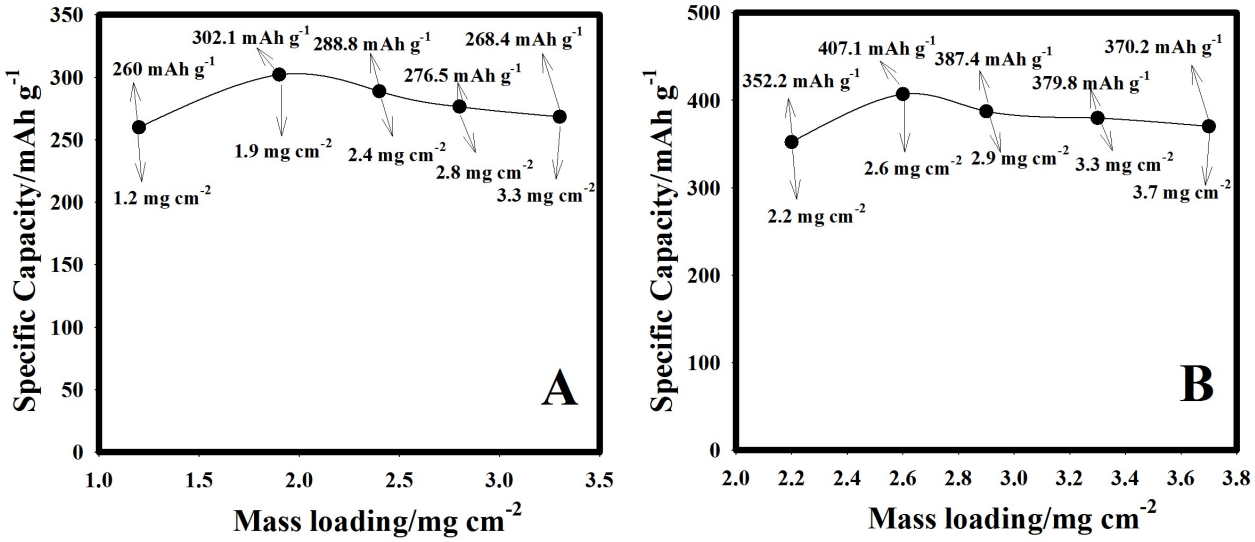

Fig. S6 (A) Specific capacity vs mass loading of NCSe (B) Specific capacity vs mass loading of NCSe@NMLDH.

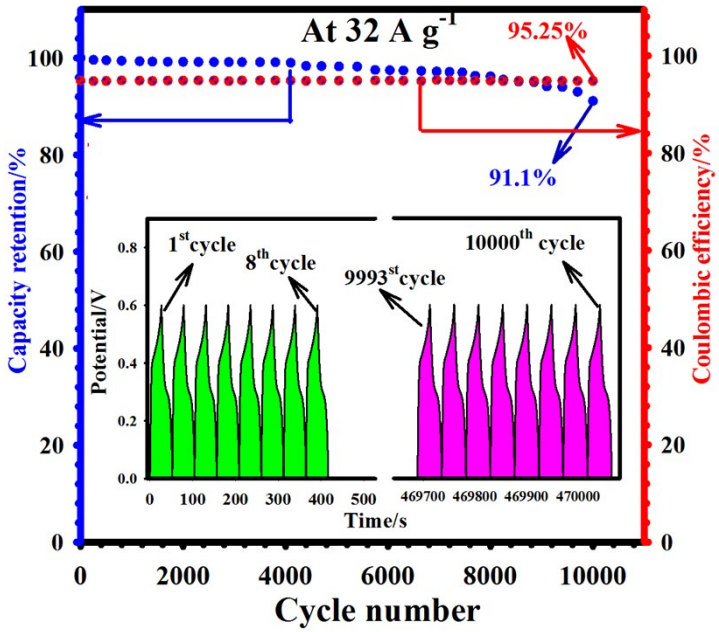

Fig. S7 The cyclability and Coulombic efficiency of the NCSe/NF electrode at 32 A g^{-1} (the inset shows the first and last eight GCD cycles).

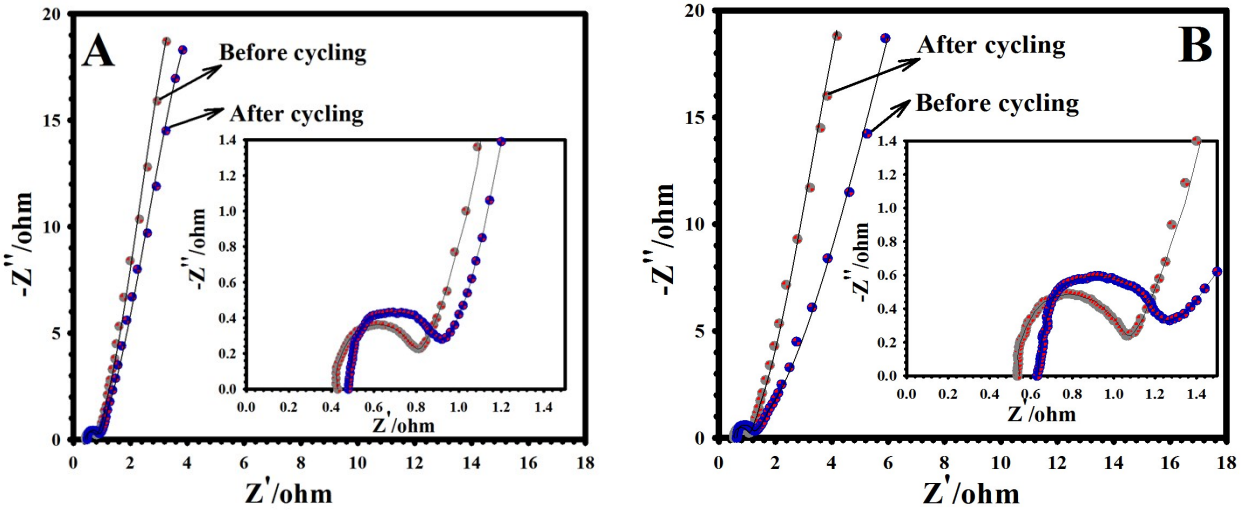

Fig S8. (A) Nyquist graphs of the NCSe@NMLDH/NF before and after cycling. (B) Nyquist graphs of NCSe/NF before and after cycling.

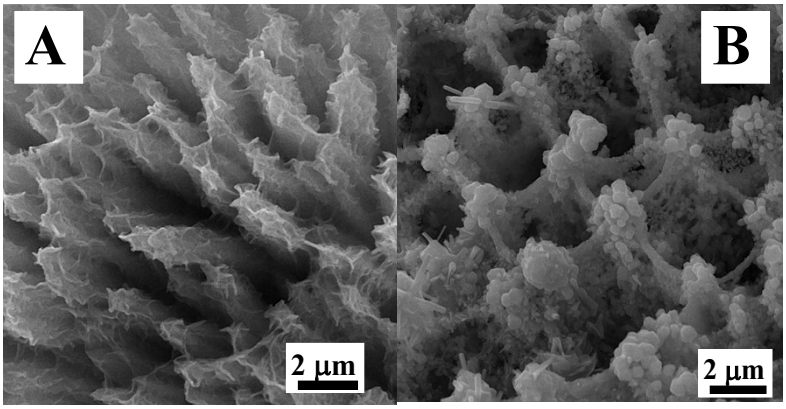

Fig S9. (A) FE-SEM image of the NCSe/NF after cycling. (B) FE-SEM image of the @NMLDH/NF after cycling

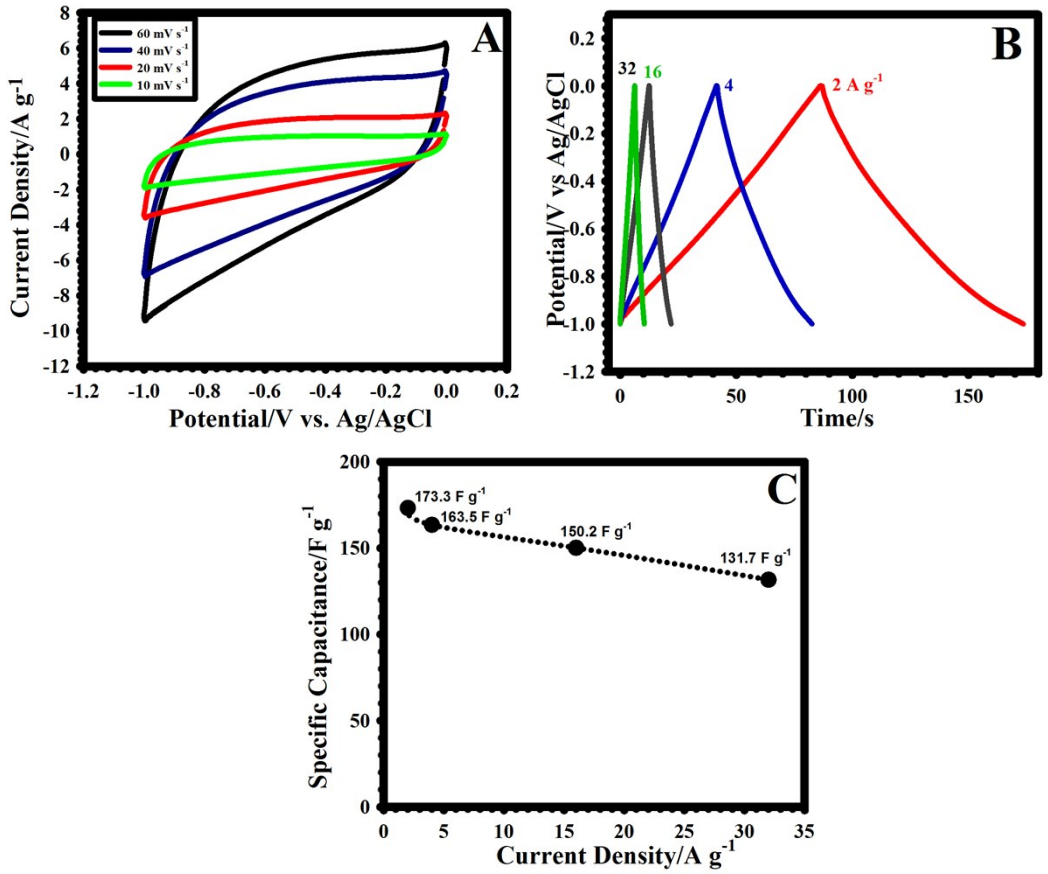

Fig S10 (A) CV curves of the AC electrode at different sweep rates. (B) GCD profiles of the AC electrode at miscellaneous current densities. (C) Rate capability of the AC electrode.

Composition	*Capacity/capacitance 3 and 2 electrodes (mAh g^{-1}, F g^{-1})*	Cycles, retention 2 and 3 electrode	ED (W h kg^{-1}) 2 Electrode	Reference
$W0_{.4}Mo_{0.6}O_3$	115.7 mAh g^{-1} at 1 A g^{-1} (3 E)	2000, 82.3% (2 E)	20.2	1
T-Nb_2O_5@Ni_2P	105 mAh g^{-1} at 1 A g^{-1} (3 E)	5000, 90% (2 E)	30.2	2
Co_3O_4	*209* mAh g^{-1} at 1 A g^{-1} (3 E)	*3000, 90 (3 E)*	41.1	3
SDBS-$Ni_2Co_1PO_4$	191.6 mAh g^{-1} at 1 A g^{-1} (3 E)	2000, 77% (3 E) 2000, 76% (2 E)	36.5	4
Ni_2P-CNFs	145 mAh g^{-1} at 1 A g^{-1} (3 E)	6000, 88% (2 E)	42	5
Co_3O_4/$Co(OH)_2$	184.9 mAh g^{-1} at 1 A g^{-1} (3 E)	5000, 90% (3 E) 5000, 91% (2 E)	37.6	6
$NiCo_2O_4$	*130* mAh g^{-1} at .63 A g^{-1} (3 E)	*100, 100 (3 E)*	16.6	7
$ZnCo_2O_4$	78.89 at 1 A g^{-1} (3 E) 34.7 at .2 A g^{-1} (2 E)		27.78	8
NCSe@NMLDH/NF	401.7 mAh g^{-1} at 2 A g^{-1} (3 E) 132.2 F g^{-1} at 1 A g^{-1} (2 E)	10000, 96.8 (3 E) 10000, 91.3 (2 E)	47	This work

Table S1. Comparison of the electrochemical performance of NCSe@NMLDH/NF electrode in three and two electrode systems with other previously reported electrodes.

References

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