Construction of hierarchical layered hydroxide grown in situ on carbon tube derived from metal-organic framework for asymmetric supercapacitors

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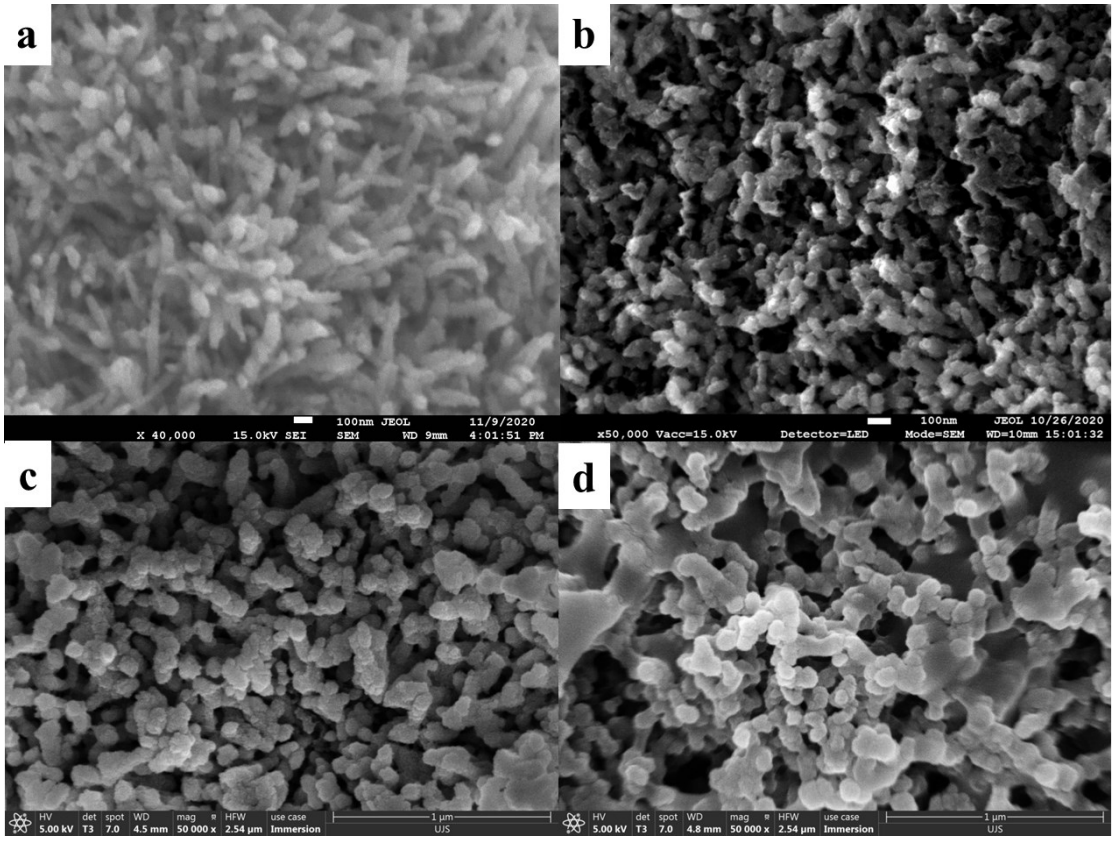

Fig.S1 The SEM NiGa-LDH@CNT-100@CC, NiGa-LDH@CNT-200@CC, NiGa-LDH@CNT-300@CC and NiGa-LDH@CNT-800@CC.

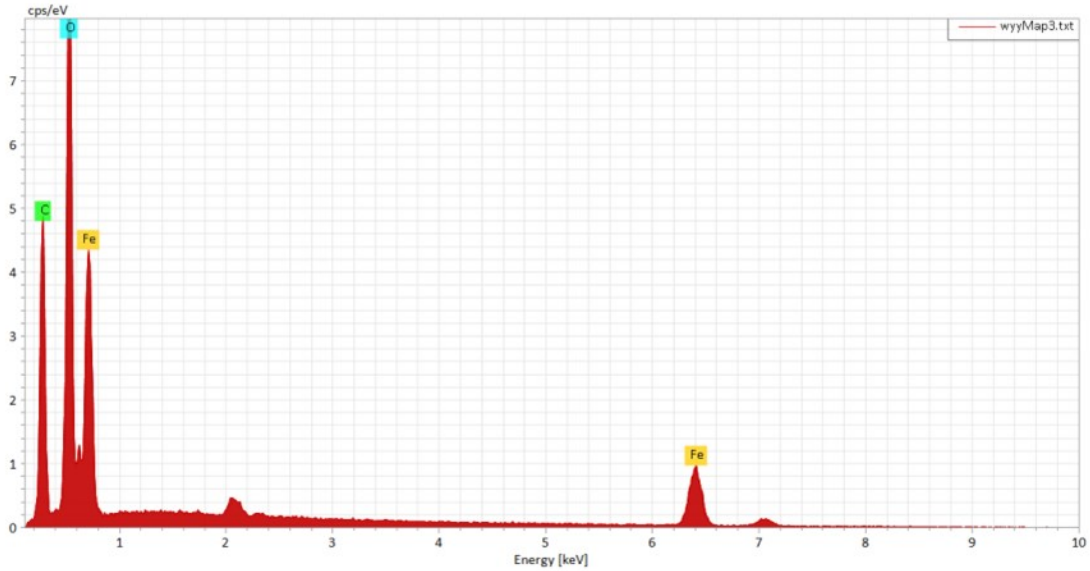

Fig.S2 The EDS images of Fe_2O_3@C@Fe_2O_3.

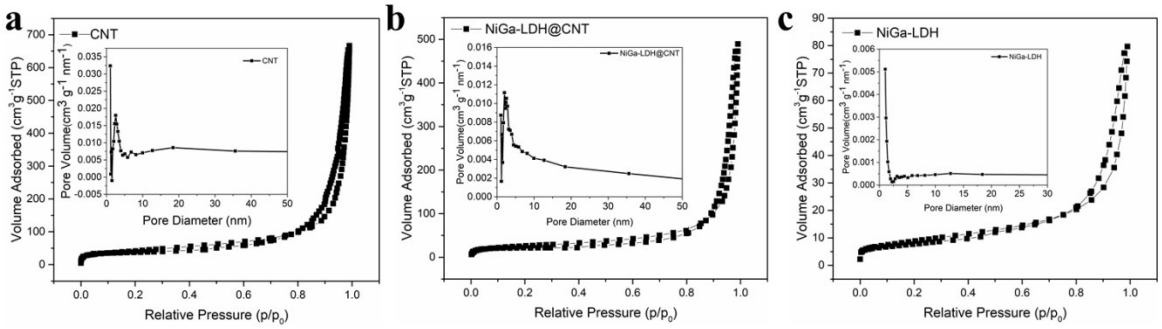

Fig.S3. Nitrogen adsorption-desorption isotherms and the corresponding pore size distribution of the as-prepared CNT, NiGa-LDH@CNT and NiGa-LDH electrode materials.

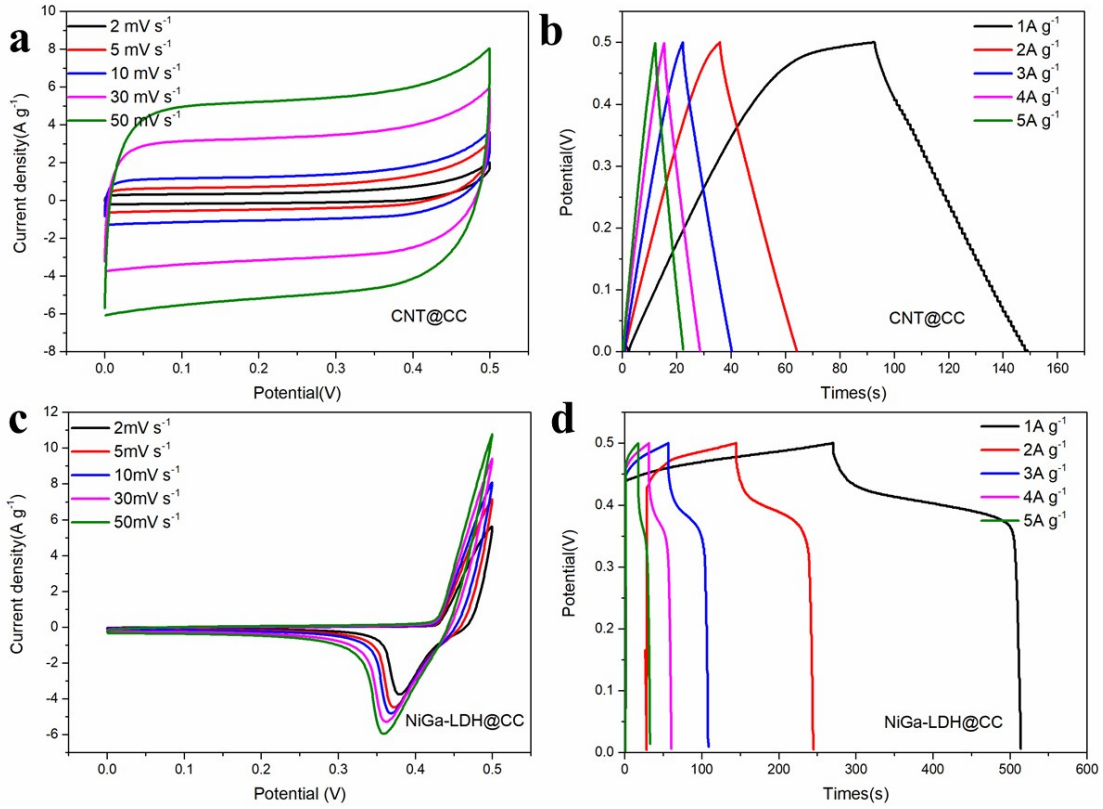

Fig.S4 The CV and GCD curves of (a) and (b) CNT@CC; (c) and (d) NiGa-LDH@CC.

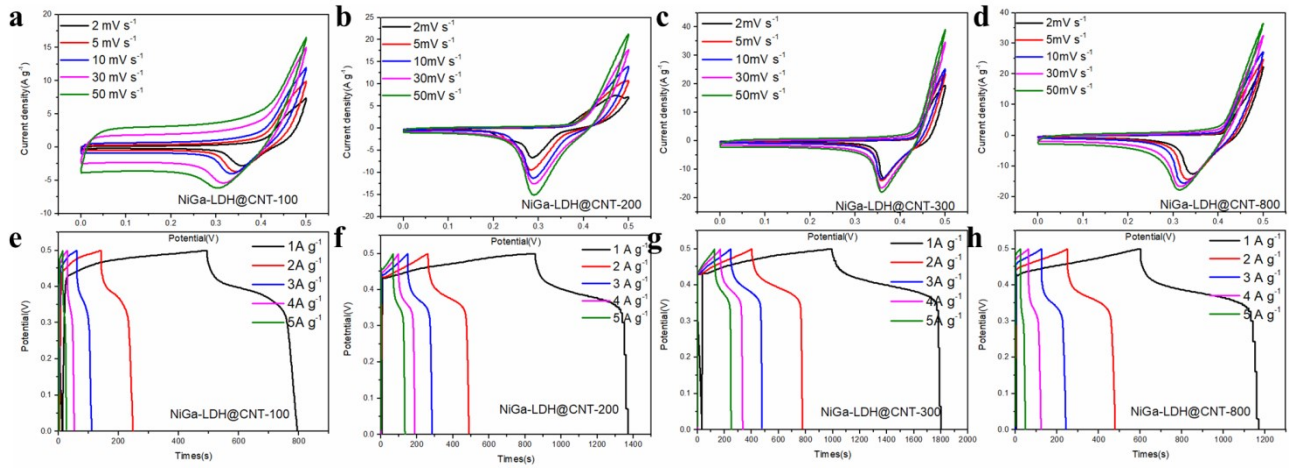

Fig.S5 The CV and GCD curves of NiGa-LDH@CNT-x@CC.

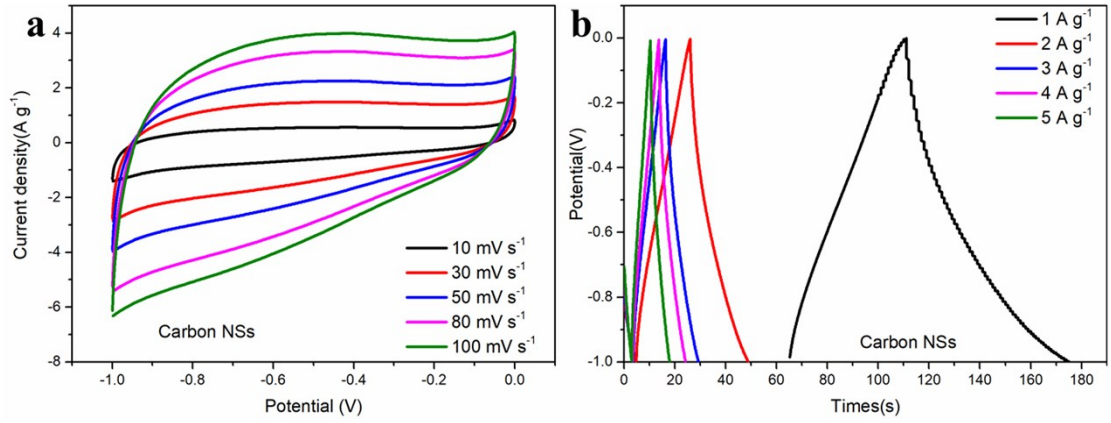

Fig.S6 The CV and GCD curves of Ni-MOF derived carbon nanosheets.

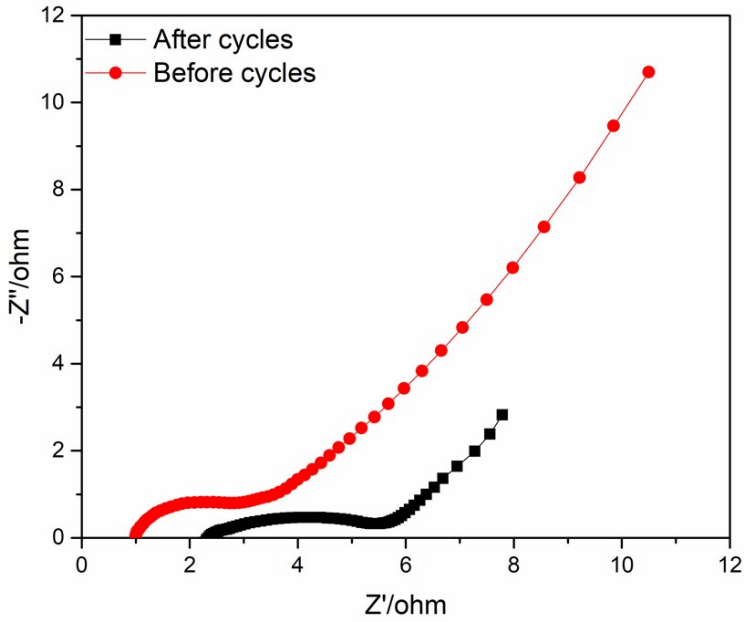

Fig.S7 The EIS curves of ASCs device before and after cycles.

Table S1 EIS parameters obtained by fitting EIS spectra of CNT@CC, NiGa-LDH@CC and NiGa-LDH@CNT-500@CC to a suitable equivalent circuit.

Parameter	CNT@CC	NiGa-LDH@CC	NiGa-LDH@CNT-500@CC
R_s/Ω	0.44	1.23	1.117
R_{ct}/Ω	3.176	16.83	6.823

Table S2 The electrochemical performance of NiGa-LDH@CNT-500@CC compared with other works

Electrode materials	**Specific capacitance**	**Refs.**
CNT@$NiMn_2O_4$	915.6 F g^{-1} at 1 A g^{-1}	1
CNT/NiO	713.9 F g^{-1} at 1 A g^{-1}	2
FeS_x/C/CNT	617.5 F g^{-1} at 1 A g^{-1}	3
NiCo-LDH@CNT	2046 F g^{-1} at 1 A g^{-1}	4
NiCoAl-LDH–carbon nanohybrids	1188 F g^{-1} at 1 A g^{-1}	5
$NiSe_2$@CNT	980.5 F g^{-1} at 1 A g^{-1}	6
NiGa-LDH@CNT-500@CC	2580 F g^{-1} at 1 A g^{-1}	This work

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