Supplementary Information

Electrochemically Reduced Ultra-high Mass Loading Three-Dimensional Carbon Nanofibers Network: A Reproducible and Stable Cell Voltage of 2.0 V and High Energy Density Symmetric Supercapacitor

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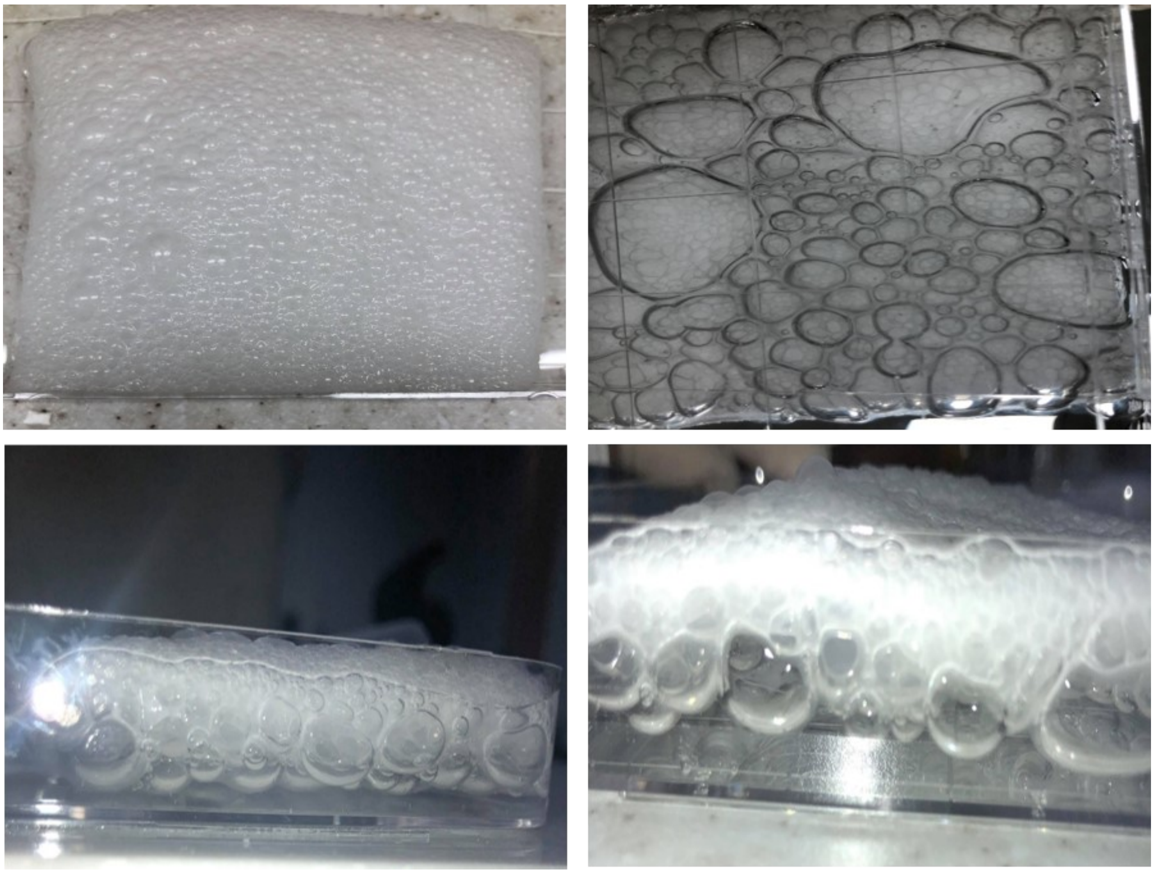

Figure S1. *Digital images of 3D mat during $NaBH_4$ treatment.*

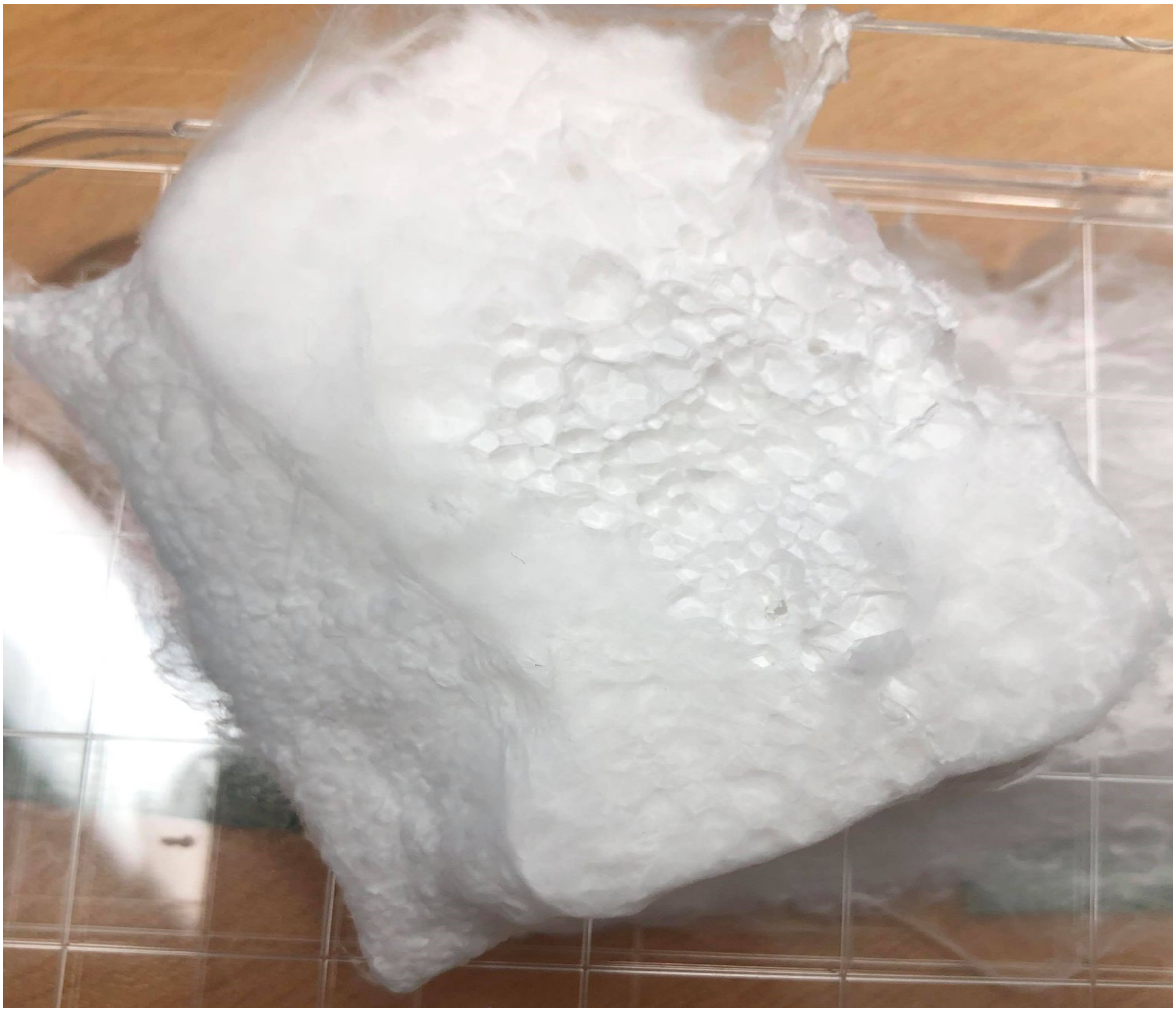

Figure S2. *Digital image of 3D mat after freeze-dry.*

Figure S3. *Digital photographs showing their representative mass loading (35, 20, and 10 mgcm*$^{-2.}$*) of the fabricated electrodes*

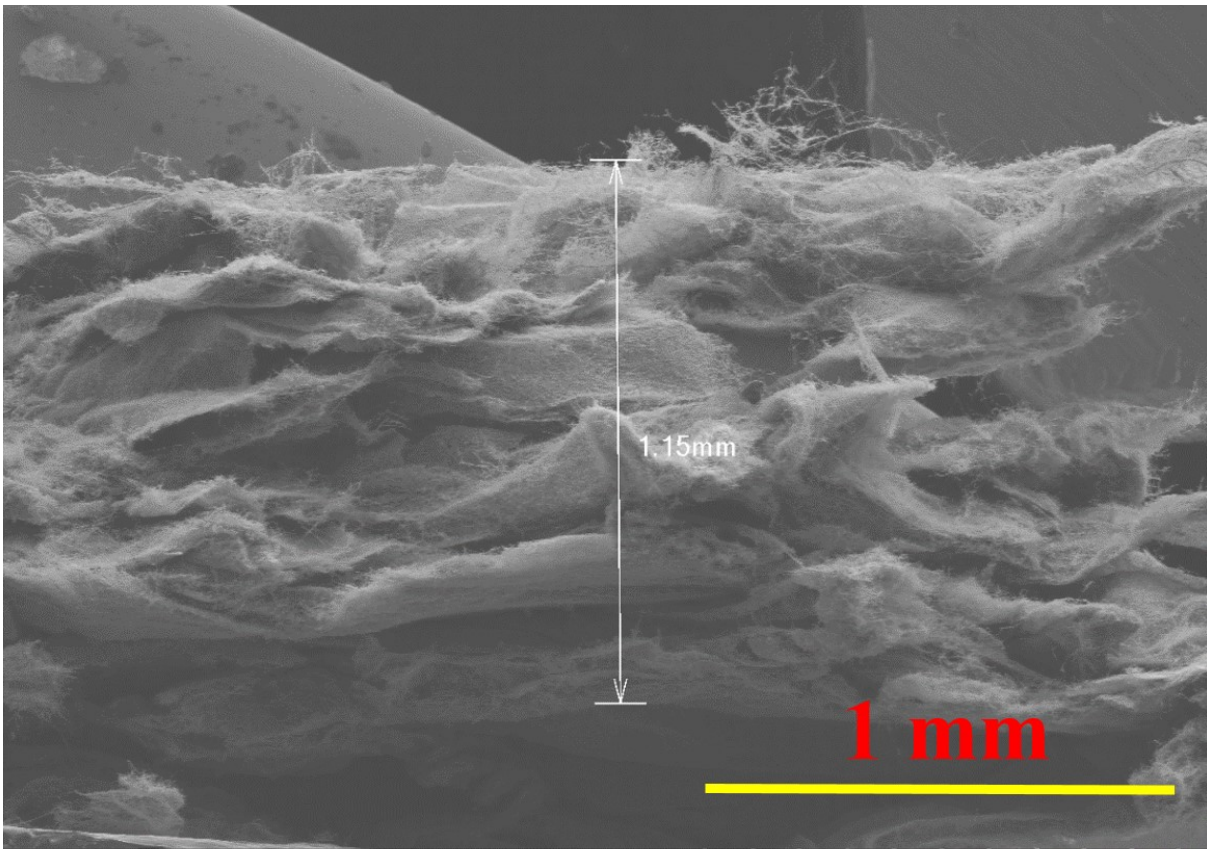

Figure S4. *Cross-section image showing thickness of the Na^{+}-LBL 3D-CNF-35 electrode*

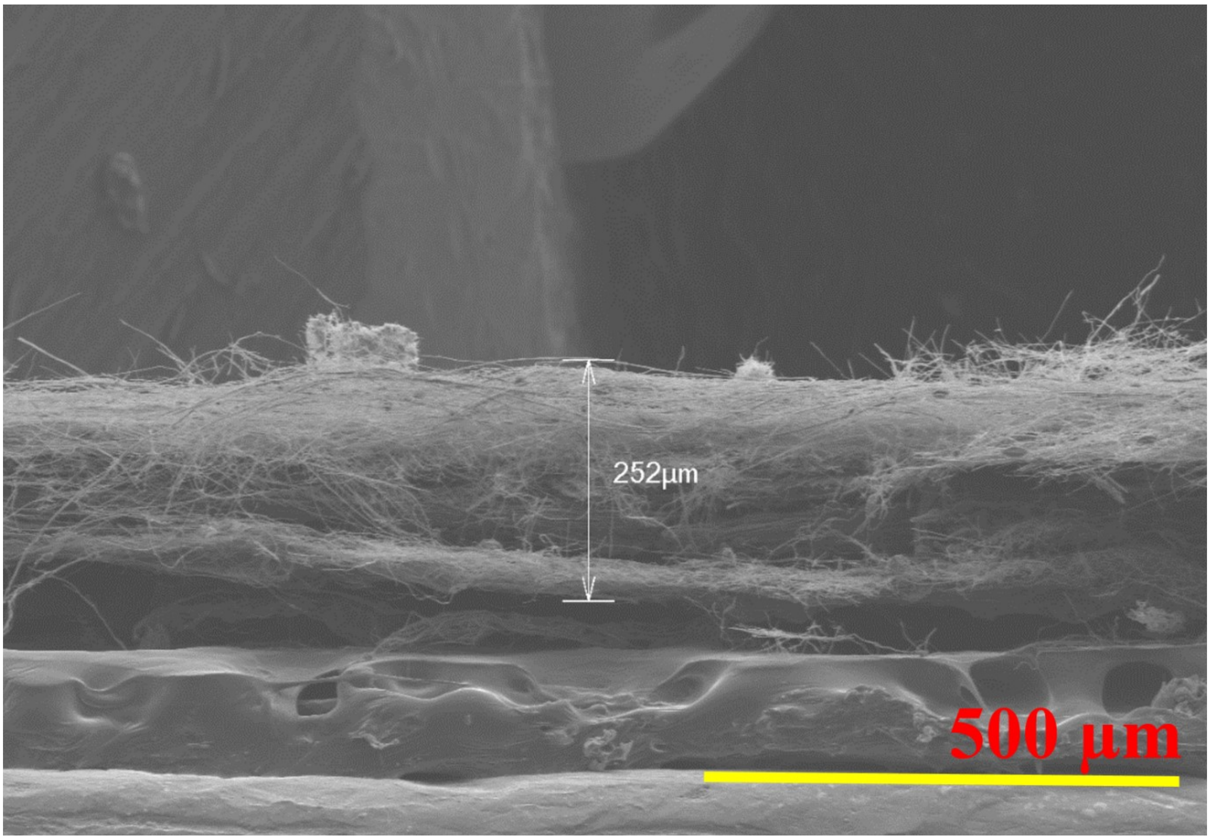

Figure S5. *Cross-section showing thickness of the Na^{+}-LBL 3D-CNF-10 electrode*

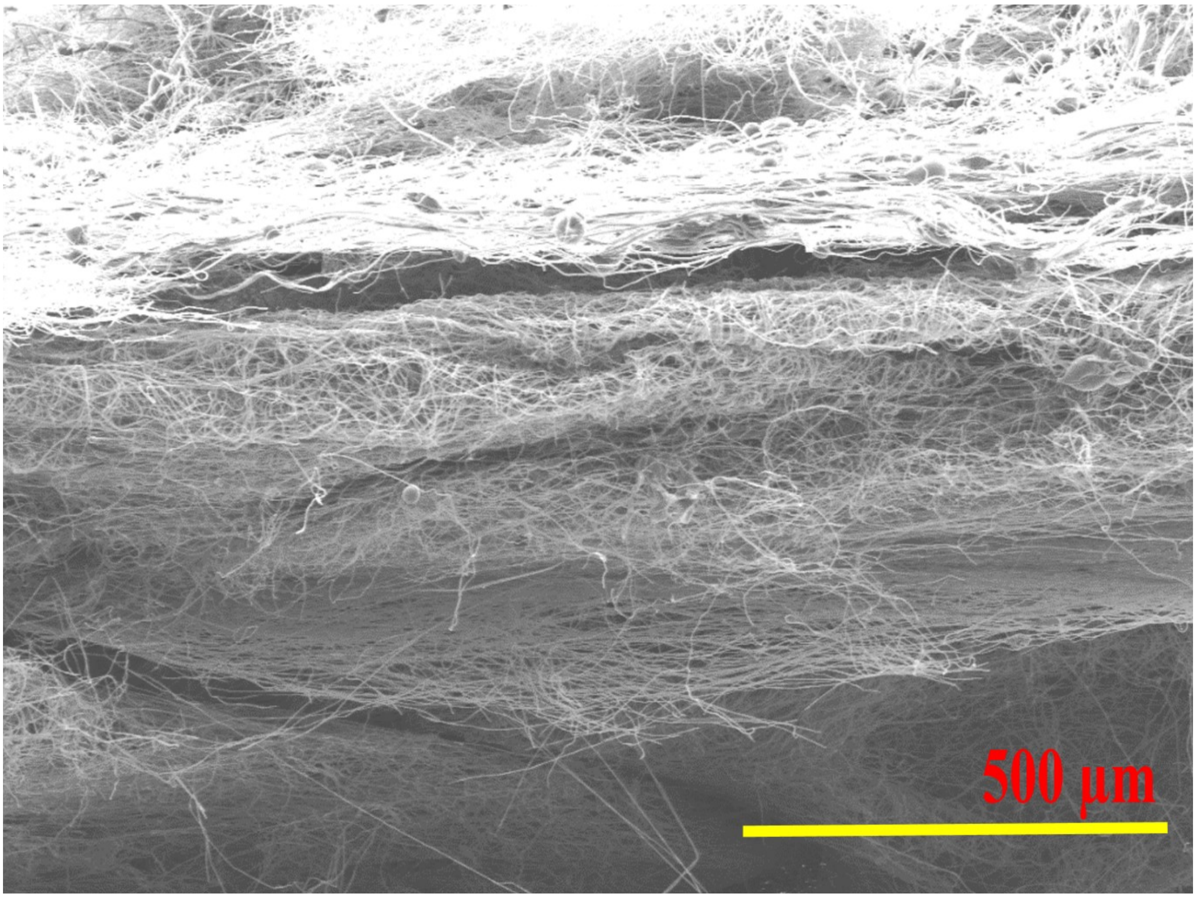

Figure S6. *Cross-section showing thickness of the Na^{+}-LBL 3D-CNF-20 electrode.*

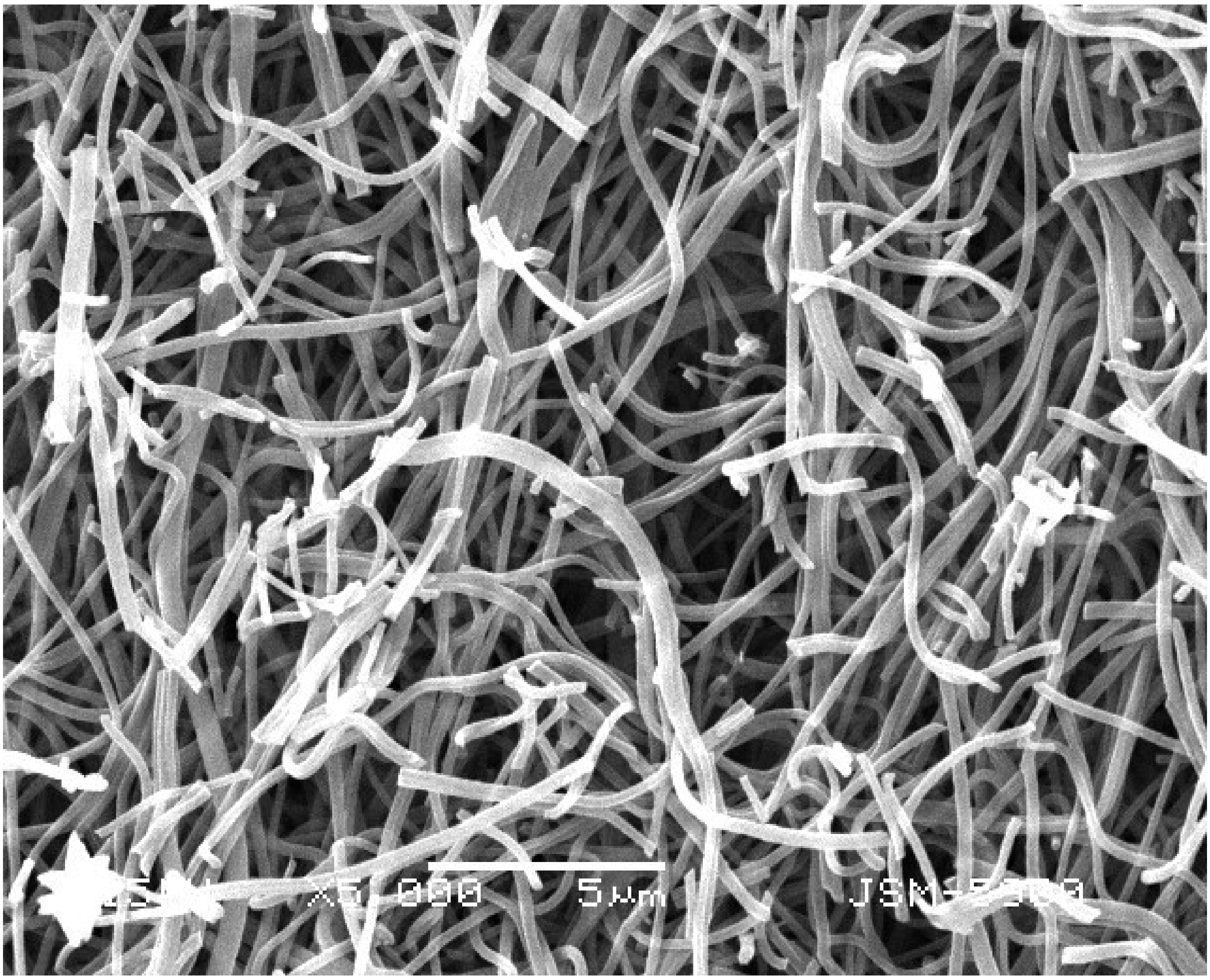

***Figure S**7. Surface morphology of pristine 2D-CNFs.*

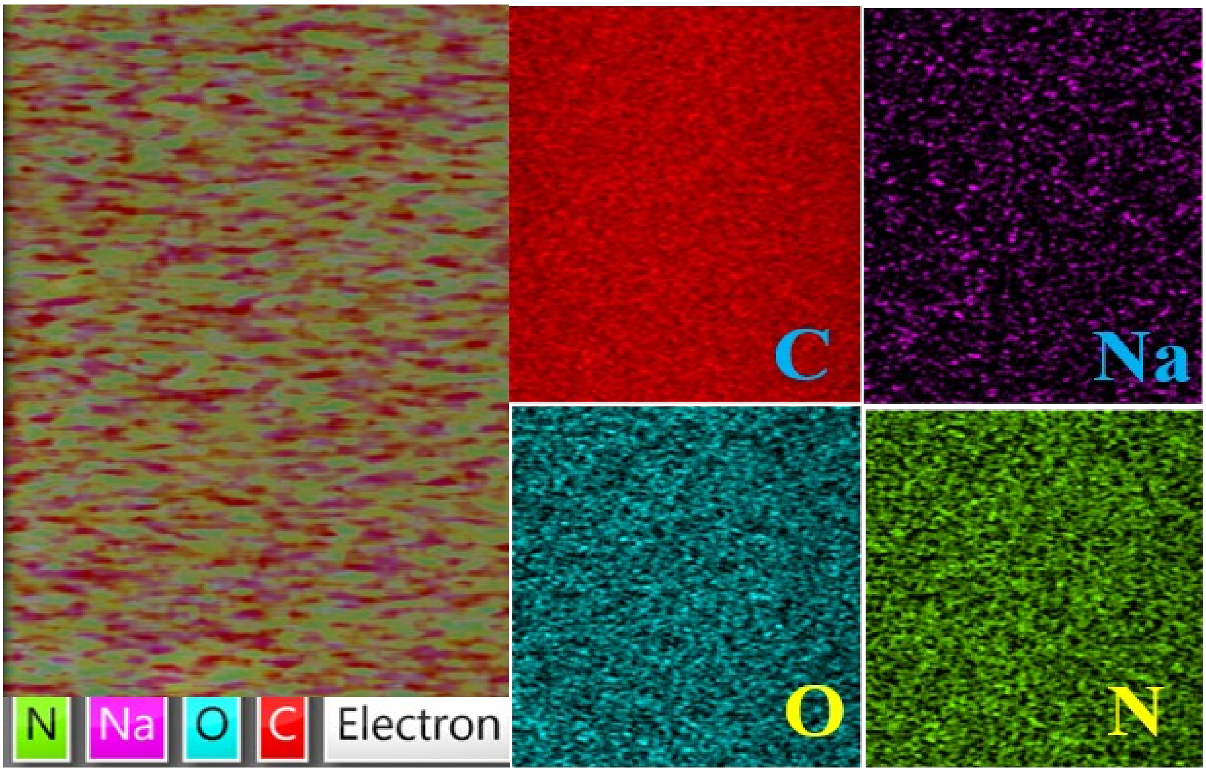

Figure S8. *Color mapping of Na⁺-LBL 3D-CNF-35 electrode.*

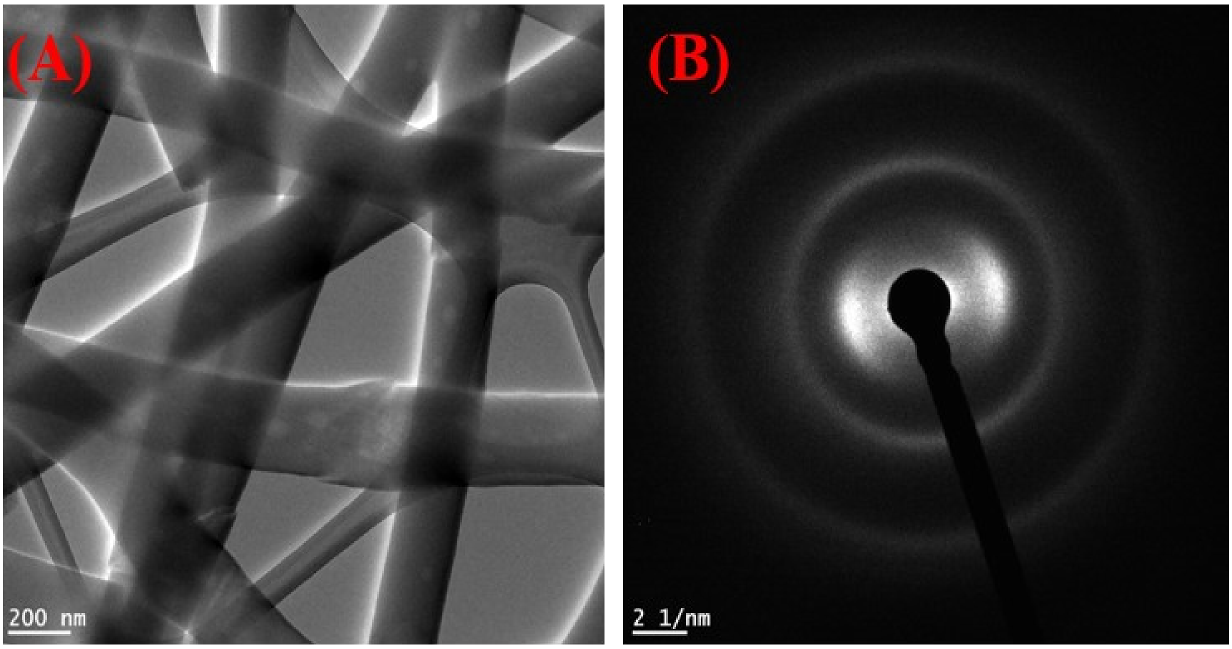

Figure S9. *TEM (A) and SAED images of LBL 3D-CNF-35 before electroreduction technique .*

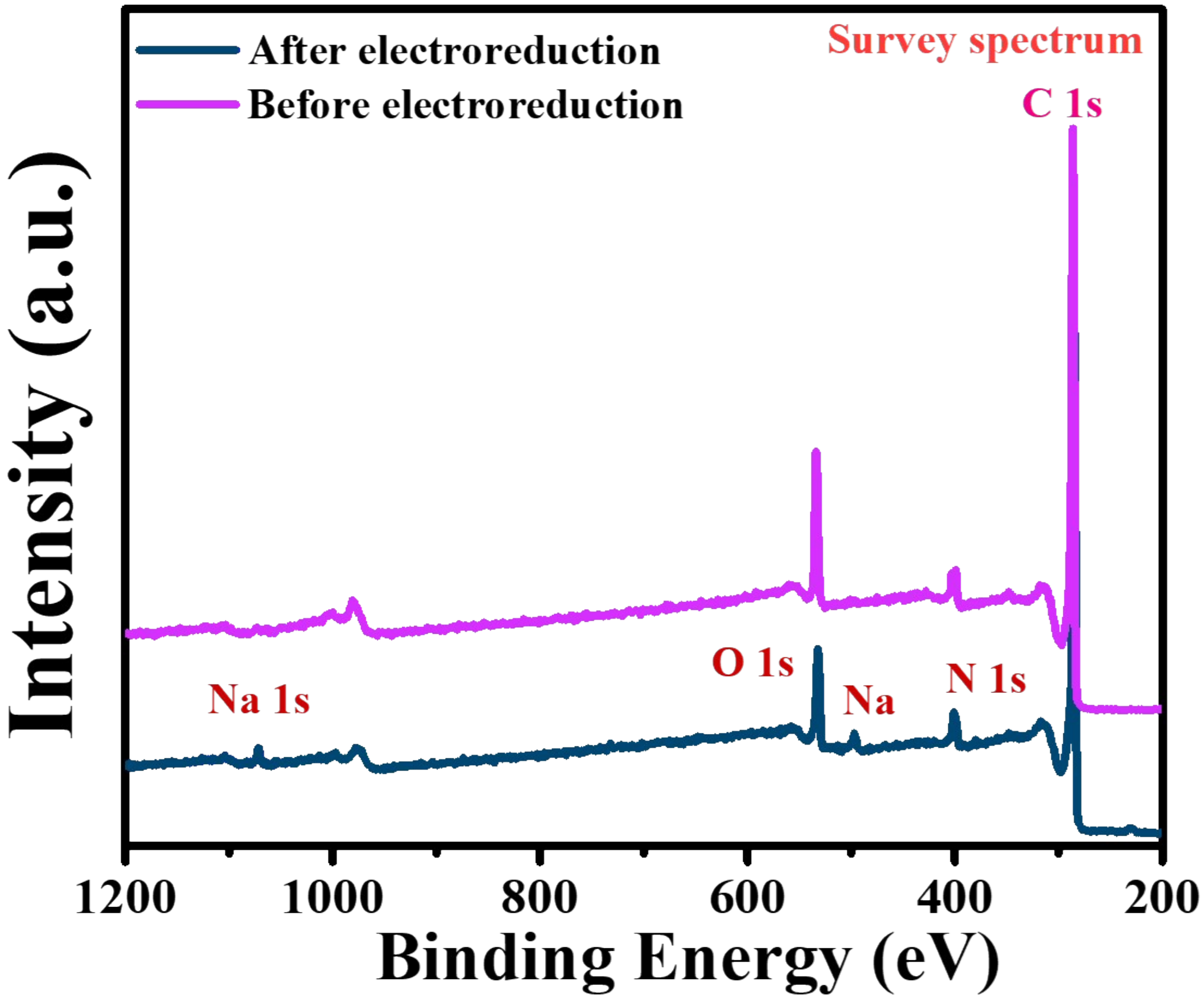

Figure S10. *Survey spectrum of LBL 3D-CNF-35 electrode before and after electroreduction technique.*

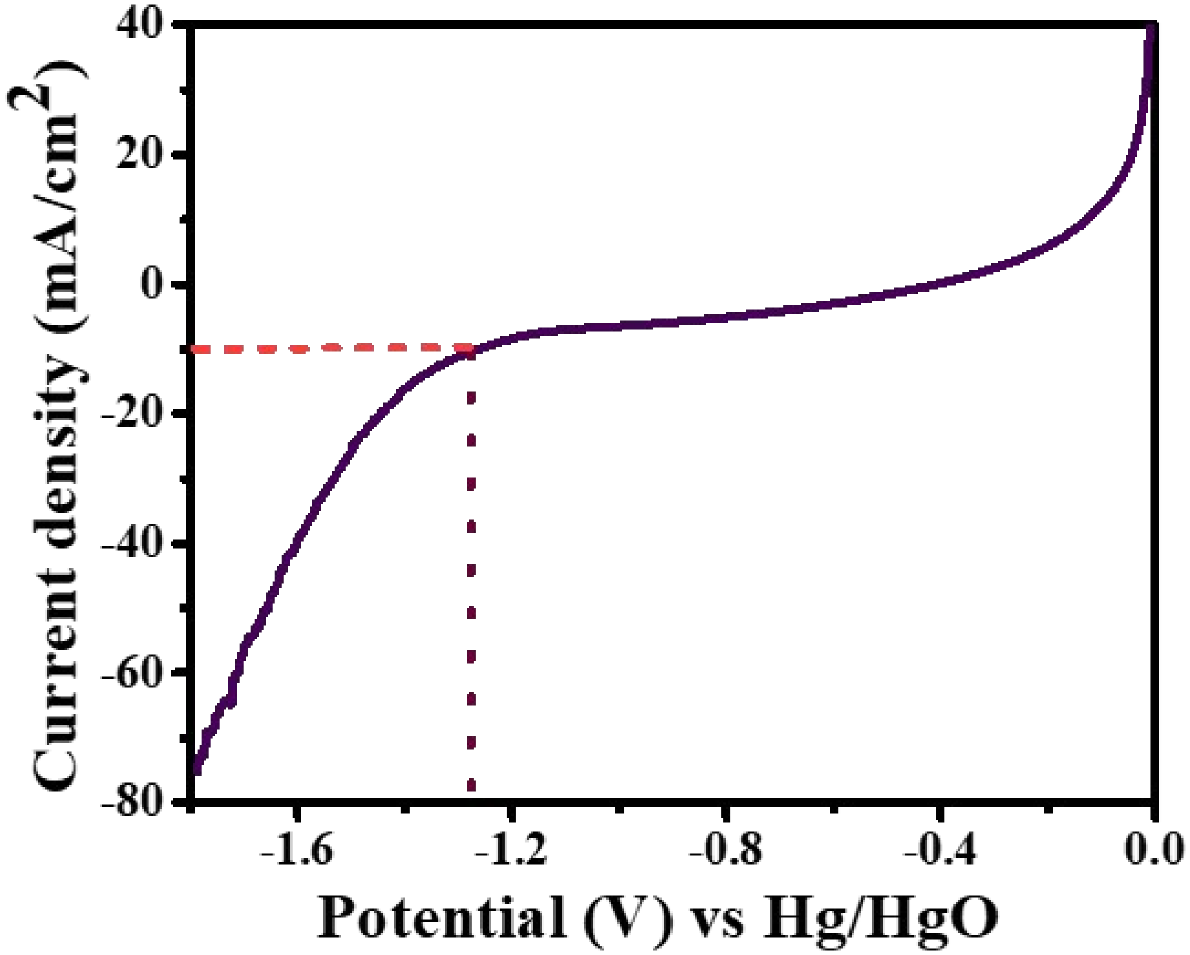

Figure S11. *Linear sweep voltammetry test of Na^+-LBL 3D-CNF-35 electrode at 10 mV/s scan rate, which indicates the standard potential for hydrogen (H_2) evolution.*

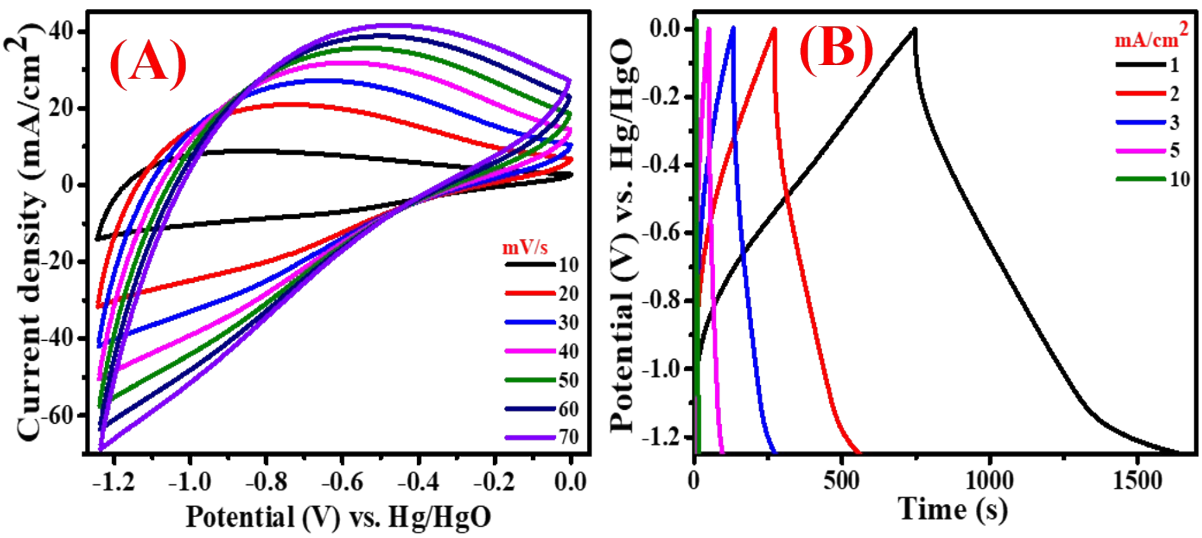

Figure S12. *CV (A) and GCD (B) curves of Na^+-LBL 3D-CN-10 electrode at different scan rates and current denisties.*

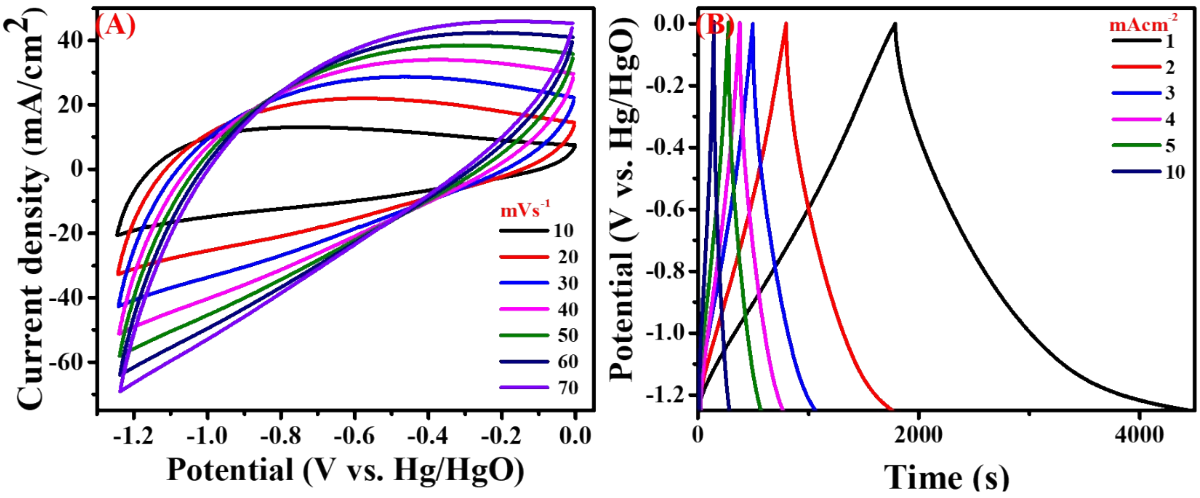

Figure S13. *CV (A) and GCD (B) curves of Na^+-LBL 3D-CN-20 electrode at different scan rates and current denisties.*

Table S1. A comparative study showing electrochemical performances of Na+-LBL 3D-CNF-35 electrode with reported literatures

S.N.	**Materials**	**Loading mass (mg)**	**Specific capacitance (Fg^{-1})**	**Working potential (V)**	**References**
1	Activated wood carbon	30	118 Fg^{-1}	-0.9 – 0.0	[1]
2	Carbon//metal oxide composite	13.4	2098 $mFcm^{-2}$	0 – 0.6	[2]
3	Activated carbon fibers	10 ± 1	161 Fg^{-1}	0 - 1	[3]
4	CNT/MnO2/graphene	9.1	3.38 Fcm^{-2}	0 - 1	[4]
5	N-doped layered porous carbon	17.7	161 Fg^{-1}	-1 – 0	[5]
6	A PPyNP/*f*-CNT	14	176.3 $mFcm^{-3}$	-0.2 – 0.6	[6]
7	3D lower structured graphene	11.16	103.6 Fg^{-1}	0 – 1	[7]
8	Highly dense mesoporous carbon	11.5	186 Fg^{-1}	0 – 1	[8]
9	Electrolyte-mediated chemically converted graphene	10	1570 $mFcm^{-2}$	0 – 1	[9]
10	**Na^+-LBL 3D-CNF**	**35**	**170 Fg^{-1} (5.93 Fcm^{-2})**	**-1.25 - 0**	**This work**

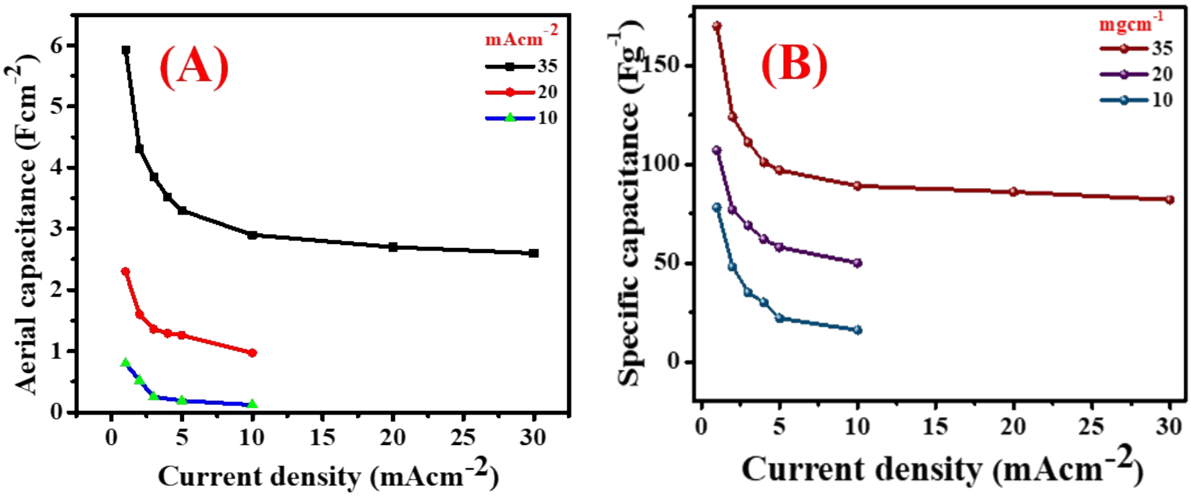

Figure S14. *Relation between aerial (A) and gravimetric (B) capacitances and current density.*

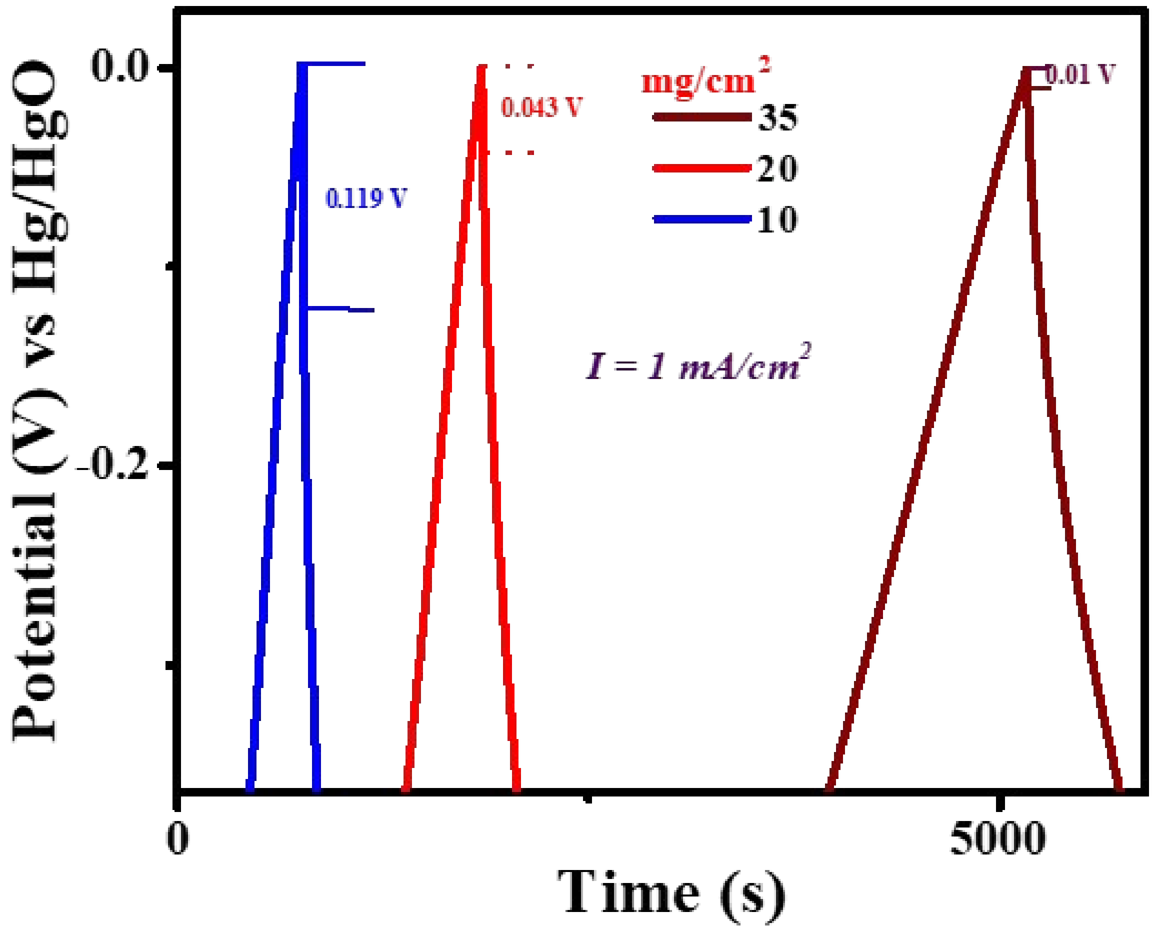

Figure S15. *IR drop of Na^+-LBL 3D-CNFs electrodes at different mass loading 10, 20, and 35 mgcm^{-2} at a current density of 1 mAcm^{-2}.*

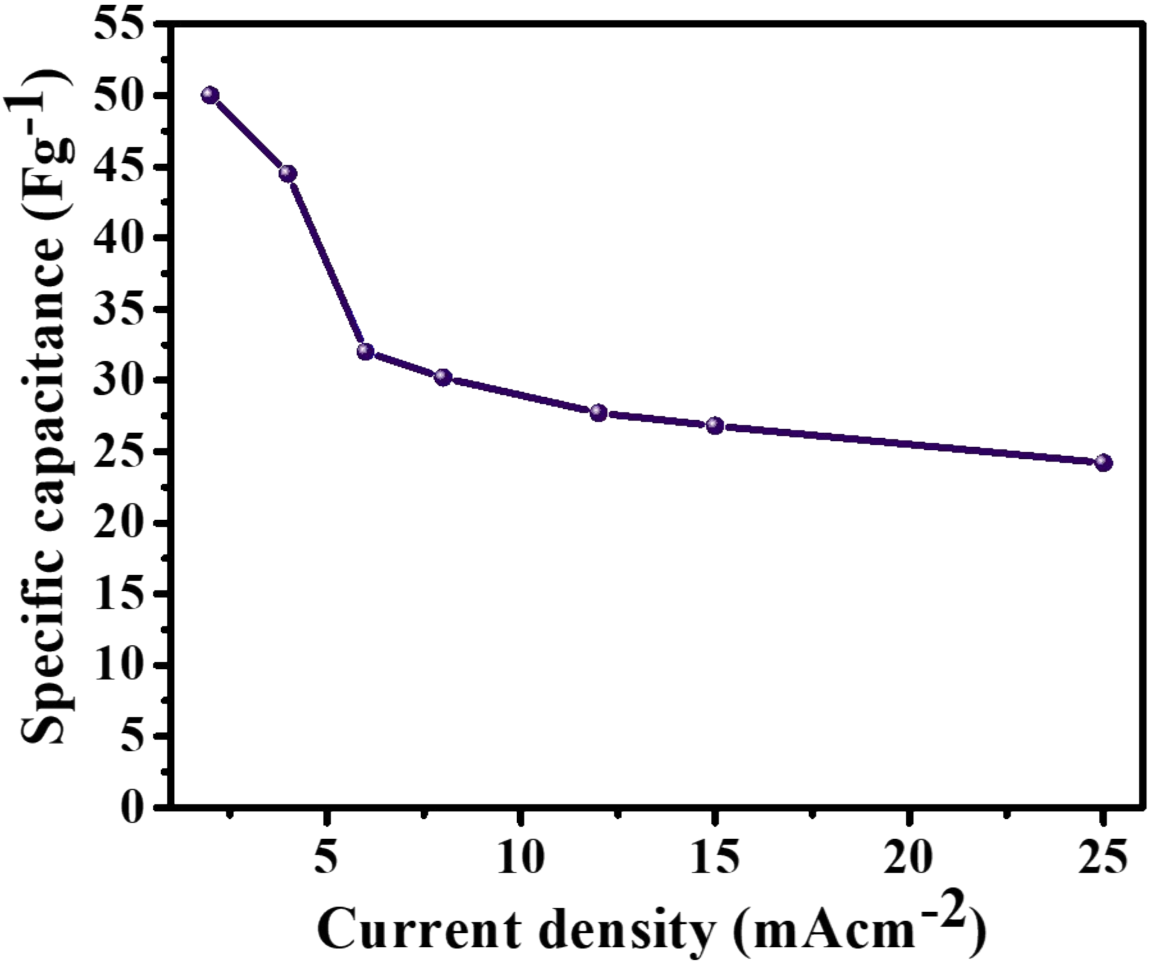

Figure S16. *Relation between specific capacitance and current density of symmetric device*

***Table S2:** A comparative study showing Energy and Power density of the carbon-based symmetric supercapacitors.*

No.	Electrode materials	Current density (mA/cm2 or A/g)	Energy density (1922 μWhcm^{-2} /Whkg^{-1})	Power density (1922 μWcm^{-2} /W/kg)	Weight of electrode materials (mg/cm^{2})	Ref.
1	ZTC-300	1.25 A/g	7.5	625	-	[10]
2	800 AC	0.3 A/g	3	220		[11]
3	PCN-900	0.1 A/g	8.02	250		[12]
4	NOCS-1/10	0.5 A/g	4.3	250		[13]
5	a-CSN/EG-10	0.3 A/g	7.3	500		[14]
6	ACG-200	1 A/g	7.5	200		[15]
7	200-HTC-800-3	0.4 A/g	8.11	400		[16]
8	N-OMCN@GN	1 A/g	6.68	250		[17]
9	MOLC	0.5 A/g	3.85	27.7	8	[18]
10	HGOCN-A	0.5 A/g	4.8	5000		[19]
11	CPC	1 A/g	6.45		20	[20]
12	L-CAs	1 A/g	26.25	1000		[21]
13	BHNC	1 A/g	6.1	26000		[22]
14	RCFs	0.2 A/g	6.1	1600		[23]
15	N/O-CNS	0.5 A/g	6.5	80		[24]
16	N/S/O-3D PC	0.3	8.4	-		[25]
17	PCNFs	1 A/g	24.4	8800		[26]
18	NPSO	0.5 A/g	23.17	500		[27]
19	NHPCs-800	0.5 A/g	23.8	402		
20	N/S-PCNS1-1	0.2 A/g	21	180		[28]

21	PCAs	0.5 A/g	19.74	500		[29]
22	PDD-DCNT	1 A/g	19.1	800		[30]
23	**Na^+-LBL 3D-CNF-35//Na^+-LBL 3D-CNF-35**	**1 $mAcm^{-2}$**	**1922 $\mu Whcm^{-2}$ (27 $Whkg^{-1}$)**	**3979 1922 μWcm^{-2} (57 Wkg^{-1})**	**35 $mgcm^{-2}$**	**This work**

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