Supplementary Information

2D Crumpled Nitrogen-doped Carbon Nanosheets Anode with Capacitive-Dominated Behavior for Ultrafast-Charging and High-Energy-Density Li-ion Capacitors

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Experimental Section

Preparation of 2D crumpled nitrogen-doped carbon nanosheets (N-CNS).

To prepare 2D N-CNS, 3 mg of graphene oxide (GO) was dispersed in 16 mL of deionized water. Subsequently, 30 μ L of pyrrole monomers and 0.5 mL of 1 M HCl were added to the above suspension. Then, 0.9 mL of ammonium persulfate solution (100 mg mL⁻¹) was added to initiate the polymerization of pyrrole monomers. After continuously reacting for 24 h, washing with deionized water and freeze-drying, 2D nanosheets of polypyrrole (PPy) coating GO (GO@PPy) were obtained. Finally, the 2D GO@PPy nanosheets were carbonized at 800 °C under different atmospheres–Ar and Ar/H₂, to obtain the crumpled N-CNS products with different nitrogen contents, denoted as N-CNS-Ar and N-CNS-Ar/H₂, respectively. To realize more nitrogen doping, GO@PPy and urea were mixed in different mass ratios of 1:5 and 1:20, and then carbonized at 800 °C for 2 h in Ar atmosphere. The resulting N-CNS samples were labeled as N-CNS-Ar-5 and N-CNS-Ar-20, respectively.

Preparation of porous carbon cathode.

The active carbons were prepared by uniformly mixing the commercial porous carbons, KOH, and NaOH with a mass ratio of 1: 4: 3, and then carbonizing them at 800 °C for 2 h, followed by 1 M HCl and deionized water rinsing until neutral. The final product was dried at 120 °C in a vacuum oven for 12 hours and named porous carbon (PC).

Material Characterization.

The morphology and microstructure of the as-prepared N-CNS materials were characterized by field emission scanning electron microscopy (SEM, JEOL, JSM-7900F), transmission electron microscopy (TEM, JEOL, JEM-F200), and atomic force microscope (AFM, Veeco, nanoscope MultiMode 3D). The X-ray powder diffractometer (XRD, JEOL, SmartLab), Raman spectrometer (HORIBA, LabRAM HR800), and X-ray photoelectron spectrometer (XPS, Thermofisher, Escalab 250 Xi+) were adopted to investigate the physical structure and chemical components of N-CNS samples. Nitrogen adsorption–desorption isotherms were measured by the physical adsorption instrument (Micromeritics, ASAP2020) to investigate the specific surface

area and pore size distribution at 77 K.

Electrochemical Measurements.

For the fabrication of anode electrode, 70 wt% N-CNS, 15 wt% super P Li, and 15 wt% sodium carboxymethyl cellulose were mixed in deionized water to form a homogeneous slurry and then coated on copper foil. The cathode electrode was prepared by dispersing the porous carbon, super P Li, and sodium carboxymethyl cellulose with a weight ratio of 8:1:1 in deionized water to obtain the slurry and then coating it on aluminum foil. Before punching into disks, both the anode and cathode were dried at 100 °C for 12 h in a vacuum oven. The mass loadings of active materials in the anode and the cathode were $0.8-1.0 \text{ mg cm}^{-2}$ and $1.6-2.0 \text{ mg cm}^{-2}$, respectively. The CR2032-type button half cells were assembled with lithium foil as counter and reference electrodes and Whatman glass fiber (GF/D) as the separator in an Ar-filled glove box. The LIC device was fabricated by adopting prelithiated 2D N-CNS as the anode and PC as the cathode. The prelithiation process of the anode electrode was cycled at 0.1 A g⁻¹ within 0.02–3 V for 10 times and then discharged at a cut-off voltage of 0.2 V. The electrolyte used for the anode electrode was composed of 1.0 M LiPF₆ in ethylene carbonate (EC), diethyl carbonate (DEC), and dimethyl carbonate (DMC) (1:1:1 in volume) with 5 wt % fluoroethylene carbonate (FEC). The highvoltage electrolyte used for the cathode electrode and LIC is the LX-113 bought from DodoChem, China.

The cyclic voltammetry (CV) measurement was performed on the electrochemical workstation CHI760E. The galvanostatic charge/discharge and cycling performance tests were conducted on LANHE M340A and CT3001A in an environment of 25 °C.

The chemical diffusivity coefficients of lithium ions (D_{Li^+}) were calculated from the galvanostatic intermittent titration technique (GITT) based on a simplified equation of Fick's second law: ¹

$$D = \frac{4}{\pi\tau} \left(\frac{mV_M}{MS}\right)^2 \left(\frac{\Delta E_s}{\Delta E_\tau}\right)^2 \tag{2}$$

where τ (s) means the duration of the current pulse, m (g), M (g mol⁻¹) and V_M (cm³

mol⁻¹) are the mass, atomic weight, and molar volume of the active material in electrode, S (cm² g⁻¹) is the area of sample-electrolyte interface, ΔE_s is the quasithermodynamic equilibrium potential difference between before and after the current pulse, and ΔE_{τ} means the total change of voltage during the current pulse, neglecting the IR drop. It is noted that M_B/V_M represents the density of active material, which can be calculated based on the following equation: ²

$$\rho = \frac{1}{V_{total} + \frac{1}{\rho_{carbon}}}$$
(3)

Where ρ (g cm⁻³) denotes the density of electrode active material, V_{total} means the total pore volume of the electrode active material obtained from the N₂ isotherm, and ρ_{carbon} represents the true density of carbon (2.2 g cm^{-3}).

The energy density (E, Wh kg⁻¹) and power density (P, W kg⁻¹) of LICs can be calculated according to the following equations:

$$E = \int_{0}^{t} \frac{IV}{m} dt$$

$$P = \frac{E}{t}$$
(4)

(5)

Where t (s) means the discharge time, $I(A g^{-1})$ represents the current density, V(V) is the cell voltage, and m (g) means the total mass of active materials on both electrodes.

Theoretical calculation.

All density functional theory (DFT) calculations were performed with the Vienna Ab Initio Package (VASP) with the NEB method for diffusion barriers along with Li⁺ migration paths. The generalized gradient approximation (GGA) using the function of the Perdew-Burke-Ernzerhof (PBE) formulation was adopted to express the exchangecorrelation energy of interacting electrons. The spin polarization and van der Waals interactions were considered throughout the calculation. The cutoff energy of 500 eV for the plane wave basis set was sufficient in all calculations. The Monkhorst-Pack method with $3 \times 3 \times 1$ k-points was used for Brillouin zone integration. A vacuum layer

was taken as 15 Å to eliminate the interaction force of atoms between layers and avoid the interference of periodic arrangement. The convergence precision at each Li⁺ was $0.01 \text{ eV} \text{ Å}^{-1}$ during the relaxation process, and the electron energy was considered selfconsistent when the energy change was smaller than 10^{-5} eV .

The Li⁺ adsorption energy is calculated as follows: $E_{ads} = E_{Li+graphene} - E_{graphene} - E_{Li+}$, Where $E_{Li+graphene}$ is the energy of Li⁺ adsorbed on the graphene surface, $E_{graphene}$ is the energy of graphene without a Li atom, and E_{Li}^+ means the energy of a single Li⁺ in vacuum space, respectively. The geometric structure and adsorption energy are obtained after the positions of all the atoms have been relaxed.



Figure S1. SEM images of 2D crumpled (a) GO@PPy, (b) N-CNS-Ar, (c, d) N-CNS-Ar/H₂, (e, f) N-CNS-Ar-5, and (g) N-CNS-Ar-20.



Figure S2. (a) TEM and (b) HADDF-STEM images of N-CNS-Ar/ H_2 .



Figure S3. HRTEM images of (a) N-CNS-Ar/H₂ and (b) N-CNS-Ar-5.



Figure S4. HRTEM images of (a) N-CNS-Ar, (b) N-CNS-Ar/H₂, (c) N-CNS-Ar-5, and (d) N-CNS-Ar-20. The wrinkles and the average interlayer spacings of the parts are highlighted by the yellow frames.



Figure S5. HADDF-STEM images and corresponding mapping images (C, N, and O) of (a) N-CNS-Ar, (b) N-CNS-Ar/H₂, and (c) N-CNS-Ar-5.



Figure S6. The C 1s and O 1s XPS spectra of (a, b) N-CNS-Ar, (c, d) N-CNS-Ar/H₂, (e, f) N-CNS-Ar-5, and (j, k) N-CNS-Ar-20.



Figure S7. The first four CV curves of (a) N-CNS-Ar, (b) N-CNS-Ar/H₂, (c) N-CNS-Ar-5, and (d) N-CNS-Ar-20 at scan rate of 0.1 mV s⁻¹.



Figure S8. The GCD profiles of (a) N-CNS-Ar/H₂ and (b) N-CNS-Ar-5 at various current densities from 0.1 to 100 A g^{-1} .



Figure S9. Cycle stability of N-CNS-Ar, N-CNS-Ar/H₂, and N-CNS-5 tested at the current density of 10 A g^{-1} after 3000 cycles.



Figure S10. The CV curves at different scan rates of (a) N-CNS-Ar/H₂ and (c) N-CNS-Ar-5, and their capacitive contribution at a scan rate of 1.0 mV s^{-1} of (b) N-CNS-Ar/H₂, and (h) N-CNS-Ar-5.



Figure S11. The relationship among micropore/mesopore area, d_{002} , capacitive contribution, and specific capacity.



Figure S12. Theoretical simulations of Li⁺ adsorption in different graphene structures. Top views of a single Li⁺ adsorbed in the (a) P-G, (b) N-Q, (c) ND-G, (d) N-6, (e) N-5, (f) two N-6 and one N-5, and (f) four N-6 and one N-5 doped graphene and their corresponding Li⁺ adsorption energies.



Figure S13. The top and side views of the charge density differences of Li⁺ adsorbed on (a) P-G and (b) N-Q doped graphene.



Figure S14. The charge density differences of Li⁺ adsorbed on (a) two N-6 and one N-5 and (b) four N-6 and one N-5 doped graphene.



Figure S15. Schematic representations and potential-energy curves of Li⁺ diffusion on graphene following the arrow-paths for (a, b) N-Q and (c, d) N-5 doped graphene. Enlarged part: hollow (H), bridge (B), and top (T) sites.



Figure S16. Schematic representations and potential-energy curves of Li⁺ diffusion in the direction perpendicular to the (a, b) P-G, (c, d) ND-G, and (e, f) N-6 doped graphene.



Figure S17. Pore structure characterization and electrochemical performance of porous carbon as the cathode for LICs. (a) Nitrogen adsorption-desorption isotherms. (b) Pore size distributions obtained by the DFT method. (c) GCD profiles at various current densities ranging from 0.1 to 60 A g^{-1} . (d) Rate performance. (e) Cycling performance at 10 A g^{-1} after 4000 cycles.

In order to characterize the pore structure, nitrogen adsorption-desorption isotherms measurements were carried out at 77 K for porous carbon. Porous carbon displays a

typical IV (H3) type isotherm with an obvious hysteresis loop at a relative pressure greater than 0.45 (Figure S17a), indicating the coexistence of hierarchical micropores and mesopores, as confirmed by pore size distribution results (Figure S17b). The porous carbon possesses high specific surface area of 1764 m² g⁻¹ and large pore volume of 1.9 cm³ g⁻¹. The electrochemical performance of the as-prepared porous carbon as the cathode of LICs was tested in the voltage range of 2–4.5 V *vs*. Li/Li⁺. The GCD profiles without an obvious plateau of porous carbon demonstrate its capacitive storage behavior (Figure S17c). Benefitting from the high surface area and abundant pore size distribution, the porous carbon displays excellent rate capability of 120 and 37 mAh g⁻¹ at current densities of 0.1 and 60 A g⁻¹, respectively, with large capacity retention of 30.8% after a 600-fold increase in the current density (Figure S17d). Besides, the porous carbon also presents outstanding cyclability with 98% capacity retention after 5000 cycles at 10 A g⁻¹ (Figure S17e).

Sample	$S_{\rm BET}{}^{[a]}$ (m ² g ⁻¹)	S _{micropore} ^[b] (m ² g ⁻¹)	S _{external} ^[c] (m ² g ⁻¹)	V _{total} ^[d] (cm ³ g ⁻¹)	V _{micropore} ^{[e}] (cm ³ g ⁻¹)
N-CNS-Ar	102	10	92	0.34	0.0047
N-CNS-Ar/H ₂	115	16	99	0.32	0.0082
N-CNS-Ar-5	123	32	91	0.46	0.017
N-CNS-Ar-20	164	65	99	0.47	0.036

Table S1. Pore structure information of 2D crumpled N-CNS-Ar, N-CNS-Ar/ H_2 , N-CNS-Ar-5, and N-CNS-Ar-20.

^{a)} Specific surface area (S_{BET}) calculated with Brunauer–Emmett–Teller (BET) method; ^{b)} *t*-Plot micropore area ($S_{Micropore}$); ^{c)}*t*-Plot external surface area ($S_{external}$); ^{d)}Total pore volume (V_{total}); ^{e)}*t*-plot micropore volume ($V_{micropore}$).

Table S2. The ratios of different types of nitrogen of 2D crumpled N-CNS-Ar/ H_2 , N-CNS-Ar, N-CNS-Ar-5, and N-CNS-Ar-20.

Sample	N-6	N-5	N-Q	Q-X
N-CNS-Ar/H ₂	30.3%	4.4%	62.1%	3.2%
N-CNS-Ar	38.2%	10.7%	45.3%	5.8%
N-CNS-Ar-5	41.6%	11.2%	44.1%	3.1%
N-CNS-Ar-20	45.5%	12.4%	37.8%	4.4%

Table S3. Rate capability comparison of N-CNS-Ar-20 with the best-reported carbon anodes.

Carbon-based anodes	Rate performance	Refs.
N-doped hard carbon nanoshells (N-GCNs)	1236 mAh g^{-1} at 0.1 A g^{-1} and 175 mAh g^{-1} at 20 A g^{-1}	3
B and N dual-doped carbon nanofibers (BNC)	1130 mAh g^{-1} at 0.1 A g^{-1} and 272 mAh g^{-1} at 10 A g^{-1}	4
Carbon nanofiber webs (CNFWs)	924 mAh g^{-1} at 0.5 A g^{-1} and 226 mAh g^{-1} at 20 A g^{-1}	5
B-doped graphene	611 mAh g^{-1} at 0.5 A g^{-1} and 235 mAh g^{-1} at 25 A g^{-1}	6
High quality, nitrogen- doped, mesoporous graphene (HNMG)	1138 mAh g ⁻¹ at 0.15 A g ⁻¹ and 448 mAh g ⁻¹ at 44.6 A g ⁻¹	7
Phosphorus-doped hard carbon (PHC-700)	1063 mAh g ⁻¹ at 0.1 A g ⁻¹ and 360 mAh g ⁻¹ at 10A g ⁻¹	8
Sponge like carbon (SLC)	$829 \ mAh \ g^{-1}$ at $0.2 \ A \ g^{-1}$ and $148 \ mAh \ g^{-1}$ at $10 \ A \ g^{-1}$	9
Polydopamine-graphene (PDA-GN)	1150 mAh g ⁻¹ at 0.05 A g ⁻¹ and 371 mAh g ⁻¹ at 5 A g ⁻¹	10
Edge-carbonylated graphene nanosheets (G-COOH)	450 mAh g^{-1} at 0.2 A g^{-1} and 145 mAh g^{-1} at 10 A g^{-1}	11
Doped hierarchically porous graphene (DHPG)	$860 \ mAh \ g^{-1}$ at 0.5 A g^{-1} and 220 mAh g^{-1} at 80 A g^{-1}	12
Nitrogen-doped carbon nanosheets (NCNs)	1107 mAh g^{-1} at 0.1 A g^{-1} and 243 mAh g^{-1} at 10 A g^{-1}	13
Holey carbon nanolayers (HCN-0)	706 mAh g^{-1} at 0.5 A g^{-1} and 256 mAh g^{-1} at 20 A g^{-1}	14
Nitrogen atoms into carbon nanospheres (ANCS)	1043 mAh g^{-1} at 0.1 A g^{-1} and 300 mAh g^{-1} at 5 A g^{-1}	15
Hierarchical N-doped hollow carbon microspheres (NHCM-12)	488 mAh g ⁻¹ at 0.1 A g ⁻¹ and 175 mAh g ⁻¹ at 5 A g ⁻¹	16

N-CNS-Ar-20	$620 \text{ mAh } \text{g}^{-1} \text{ at } 0.1 \text{ A } \text{g}^{-1} \text{ and} \\ 121 \text{ mAh } \text{g}^{-1} \text{ at } 100 \text{ A } \text{g}^{-1}$	This work
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Model	Adsorption energy (E_{ads} , eV)
Pristine graphene	-1.61
Graphene with nanopore-defect	-4.05
Graphene with N-Q doping	-1.33
Defective graphene with N-5 doping	-4.94
Defective graphene with N-6 doping	-4.33
Defective graphene with two N- 6 and one N-5 doping	-5.38
Defective graphene with four N-6 and one N-5 doping	-6.20

Table S4. The Li^+ adsorption energies of different graphene models.

Model	E _d (eV) Pathway:H ₁ – B ₁ –H ₂	<i>E</i> _d (eV) Pathway:H ₂ – B ₂ –H ₃	<i>E</i> _d (eV) Pathway:H ₂ (H ₃)–D ₁
Pristine graphene	0.38		
Graphene with N-Q doping	0.42	0.11	
Graphene with nanopore-defect	0.24		0.12
Defective graphene with N-5 doping	0.20	0.20	0.04
Defective graphene with N-6 doping	0.33	0.34	0.07

Table S5. Diffusion barrier energies (E_d) of Li⁺ diffusion on different graphene models following the path with arrows within the graphene plane.

Model	$E_{\rm d}~({\rm eV})$
Pristine graphene	7.71
Graphene with nanopore-defect	-4.24
Defective graphene with N-6 doping	-5.61

Table S6. Diffusion barrier energies (E_d) of Li⁺ diffusion along the direction perpendicular to the graphene models.

LIC systems	Energy density and corresponding power density	Cycling stability	Voltage window (V)	Refs.
Activated nitrogen-doped graphene sheet//nitrogen-doped graphene sheet (A-N-GS//N-GS)	187.9 Wh kg ⁻¹ @2.25 kW kg ⁻¹ 111.4 Wh kg ⁻¹ @11.25 kW kg ⁻¹	93.5% capacity retention after 3000 cycles at 2.0 A g^{-1}	0-4.5	17
Nitrogen-doped carbon nanosheets//nitrogen-doped carbon nanosheets (NCNs-2//NCNs-2)	218 Wh kg ⁻¹ @225 W kg ⁻¹ 97.5 Wh kg ⁻¹ @22.5 kW kg ⁻¹	84.5% capacity retention after 10000 cycles at 5.0 A g ⁻¹	0–4.5	13
Nitrogen Doping into Carbon Nanospheres//nitrogen Doping into Carbon Nanospheres (ANCS//ANCS)	206.7 Wh kg ⁻¹ @225 W kg ⁻¹ 115 Wh kg ⁻¹ @22.5 kW kg ⁻¹	86.6% capacity retention after 10000 cycles at 4.0 A g ⁻¹	0–4.5	15

Table S7. Performance comparison of our N-CNS-Ar-20//porous carbon LIC with currently reported LICs.

High defect mesopore-				
dominant porous carbon//high defect mesopore-dominant porous carbon (HDMPC//HDMPC)	106.4 Wh kg ⁻¹ @500 W kg ⁻¹ 10.2 Wh kg ⁻¹ @88.8 kW kg ⁻¹	$\begin{array}{rrr} 88.3\% & \mbox{capacity} \\ \mbox{retention} & \mbox{after} & 8000 \\ \mbox{cycles at } 2.0 \mbox{ A } \mbox{g}^{-1} \end{array}$	1-4	18
Spiral Graphene//hierarchically porous carbon (SG-1000//HPC-10)	109 Wh kg ⁻¹ @ 55 W·kg ⁻¹ 70 Wh kg ⁻¹ @ 5478 W·kg ⁻¹	90.3% after 10000 cycles at 5.0 A g^{-1} 95.9% after 4000 cycles at 0.8 A g^{-1}	2-4.2	19
Hierarchical (macro-, meso-, micro-) pore structural graphene//edge-carbonylated graphene nanosheets (MP-G//G-COOH)	120.8 Wh kg ⁻¹ @228.8 W kg ⁻¹ P _{max} :53.5 kW kg ⁻¹	98.9% after 50000 cycles at 5.0 A g^{-1}	1.0-4.2	11
Co ₄ Fe-BDC self-made activated carbon (Co ₄ Fe-BDC SMAC)	199.7 Wh kg ⁻¹ @200 W kg ⁻¹ 26.3 Wh kg ⁻¹ @10 kW kg ⁻¹	73.1% capacity retention after 2000 cycles at 1.0 A g^{-1}	0–4	20

NbN@C//activated carbon (NbN@C//AC)	125.5 Wh kg ⁻¹ @76 W kg ⁻¹ 53.8 Wh kg ⁻¹ @7.818 kW kg ⁻¹	$\begin{array}{c} 80.1\% & \text{capacity} \\ \text{retention after } 10000 \\ \text{cycles at } 1.0 \ \text{A g}^{-1} \end{array}$	0–4	21
C_6O_6 activated carbon (C_6O_6 AC)	160 Wh kg ⁻¹ @108 W kg ⁻¹ 61 Wh kg ⁻¹ @10.75 kW kg ⁻¹	About 80% capacity retention after2400 cycles at 1.0 A g ⁻¹	0.01–4.3	22
Fe ₂ N activated carbon (Fe ₂ N//AC)	157 Wh kg ⁻¹ @200 W kg ⁻¹ 65 Wh kg ⁻¹ @20 kW kg ⁻¹	93.5%capacityretentionafter 5000 cycles at 1.0 A g ⁻¹	0.01–4	23
OCH3-cHBC//activated carbon (OCH ₃ -cHBC//AC)	198.1 Wh kg ⁻¹ @130.4 W kg ⁻¹ 7.569 Wh kg ⁻¹ @6.566 kW kg ⁻¹	$\begin{array}{c} 80\% & \text{capacity} \\ \text{retention} & \text{after} & 13000 \\ \text{cycles at } 6.0 \ \text{A g}^{-1} \end{array}$	0.8–3.8	24
FeSe ₂ @carbon nanofibers//carbon nanofibers@ activated carbon (FeSe ₂ @CNF//CNF@AC)	156.5 Wh kg ⁻¹ @250 W kg ⁻¹ 93.8 Wh kg ⁻¹ @25 kW kg ⁻¹	86.7% capacity retention after 3000 cycles at 2.0 A g ⁻¹	1–4	25
WNb ₂ O ₈ // activated carbon (S-WNO//AC)	150 Wh kg ⁻¹ @113 W kg ⁻¹ 33 Wh kg ⁻¹ @9 kW kg ⁻¹	$\begin{array}{c} 85\% & \text{capacity} \\ \text{retention} & \text{after} & 1000 \\ \text{cycles at } 1.0 \text{ A g}^{-1} \end{array}$	1–3.5	26

Ni _{1.2} Co _{0.8} P// activated carbon (Ni _{1.2} Co _{0.8} P//AC)	125.3 Wh kg ⁻¹ @187.8 W kg ⁻¹ 72.3 Wh kg ⁻¹ @9.5 kW kg ⁻¹	78.8%capacityretentionafter10700cycles at 1.0 A g ⁻¹	0.5–4	27
Li ₃ V ₂ O ₅ nanospheres// activated carbon (LVO-NS//AC)	105.89 Wh kg ⁻¹ @99.37 W kg ⁻¹ 61.9 Wh kg ⁻¹ @12.75 kW kg ⁻¹	87% capacity retention after 4000 cycles at 1.0 A g ⁻¹	1–4.1	28
H-Nb ₂ O ₅ // activated carbon (H-Nb ₂ O ₅ //AC)	97.8 Wh kg ⁻¹ @ 56.1 W kg ⁻¹ 48.4 Wh kg ⁻¹ @ 5.45 kW kg ⁻¹	76.9% capacity retention after 5000 cycles at 1.0 A g^{-1}	1–3	29
Defective hierarchical porous carbon-800//defective hierarchical porous carbon-800 (DHPCs-800//DHPCs-800)	208 Wh kg ⁻¹ @ 450 W kg ⁻¹ 79 Wh kg ⁻¹ @ 53.4 kW kg ⁻¹	No capacity loss after 4000 cycles at 5.0 A g^{-1}	0-4.5	30
Cubic-like porous carbon//N- doped graphene nanolayer (CPC//N-GNL)	133.5 Wh kg ⁻¹ @ 1.178 W kg ⁻¹ 72 Wh kg ⁻¹ @ 11.78 kW kg ⁻¹	84.4%capacityretentionafter5000cycles at 2.0 A g ⁻¹	0-4	31
Egg white-NaCl//Fe ₃ O ₄ @C- 2 (a-EW-NaCl//Fe ₃ O ₄ @C-2)	124.7 Wh kg ⁻¹ @2.547 kW kg ⁻¹ 57.8 Wh kg ⁻¹ @16.987 kW kg ⁻¹	88.3% capacity retention after 2000 cycles at 2.0 A g ⁻¹	1–4	32

N CNIS Ar 20//normula	222 Wh ltg=1 @1 12 ltW ltg=1	91.5% capacity		
IN-CINS-AI-20//pollous	$225 \text{ Winkg}^{-1} @65 \text{ kW kg}^{-1}$	retention after 5000	0-4.5	This work
carbon	75 WII Kg ⁻ (205 KW Kg ⁻	cycles at 5.0 A g^{-1}		

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