Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Graphene Sheets like structured Carbon derived from Coir Pith Waste for Electrochemical Energy Storage Devices

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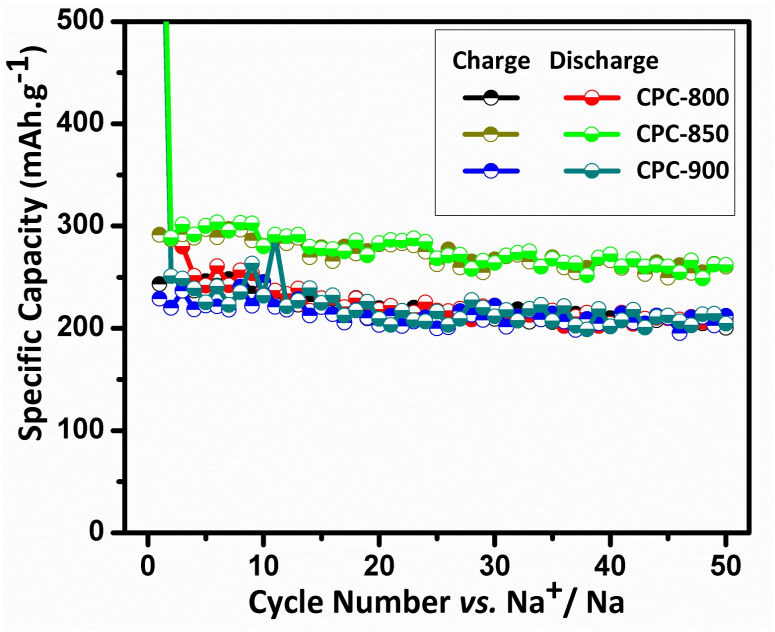

Fig. S1 Cumulative electrochemical charge discharge behaviour of CPC-800, CPC-850 and CPC-900 anodes vs. Na^+/ Na at 50 mA g^{-1} current condition

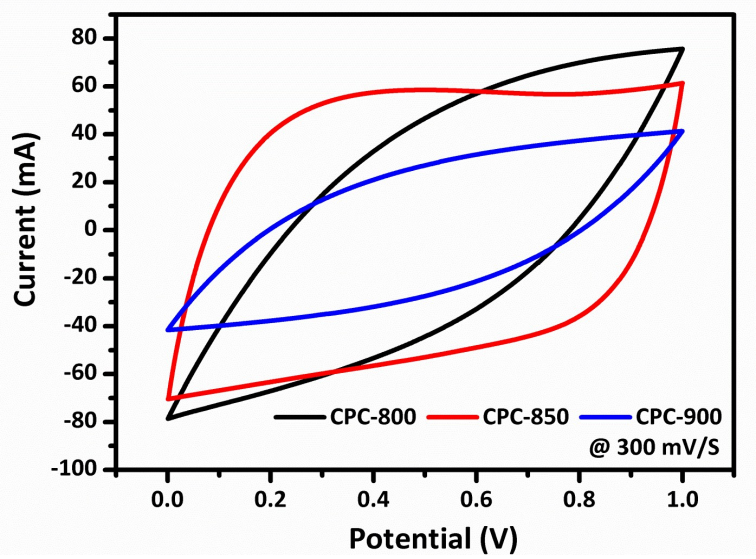

Fig. S2 Cycling voltammogram of CPC//CPC capacitors at 300 mV s^{-1} stability in 6M KOH electrolyte

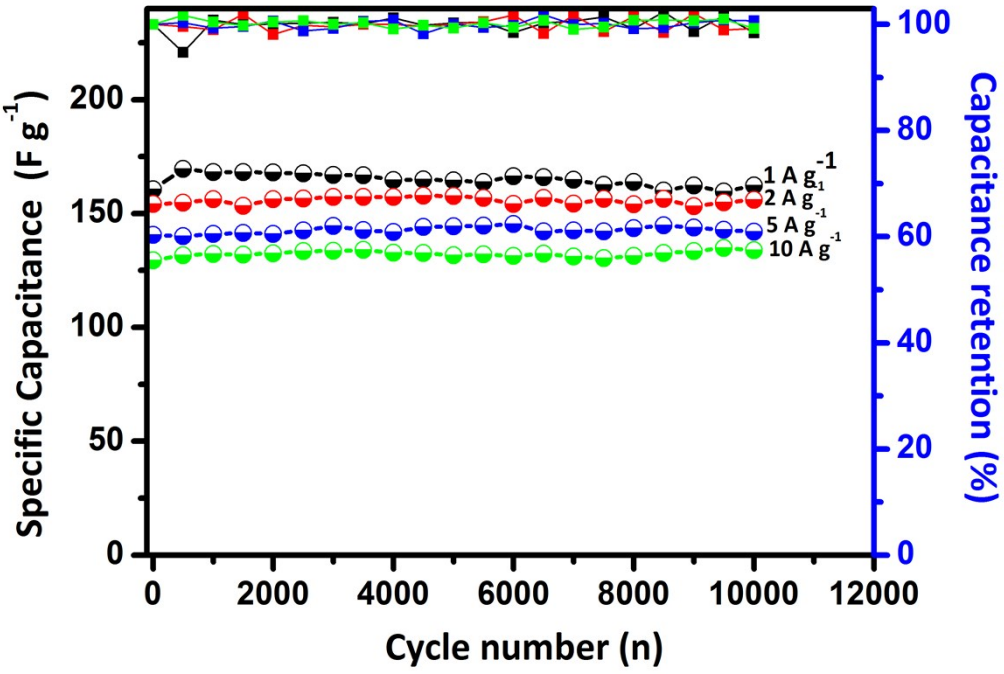

Fig. S3 Capacity retention behavior symmetric capacitor of CPC-850//CPC-850 symmetric cell at 1, 2 and 5 A g^{-1} current densities for 10000 cycles

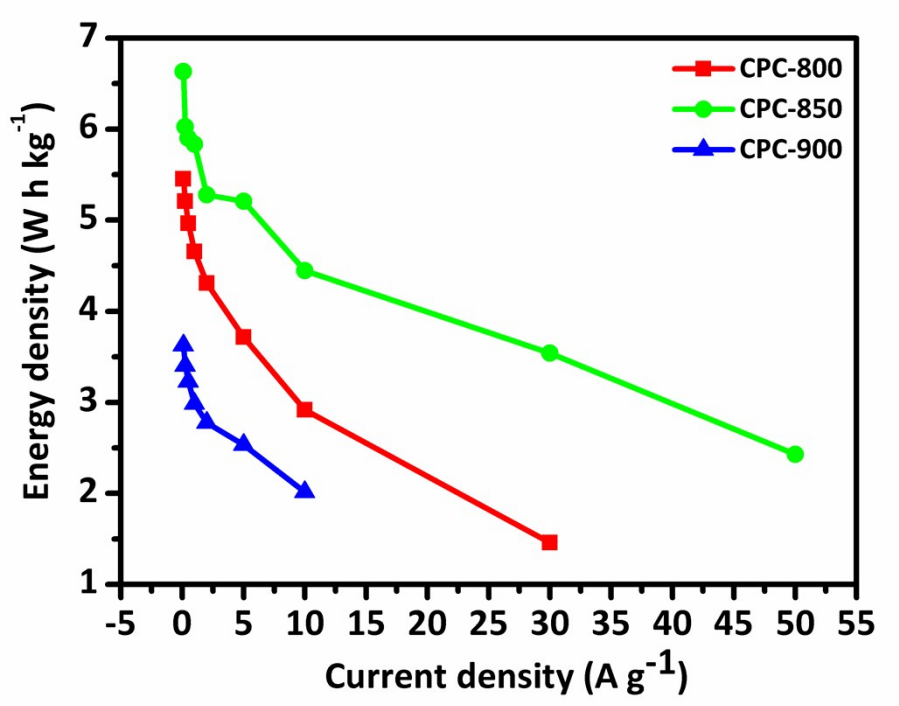

Fig. S4 Energy density values of CPC anodes at various current densities

Table S1 Cycling performance of CPC-850 anode upon extended cycles at 50 mA g^{-1} current density condition in SIBs

Cycle no.	Charge capacity (mAh /g)	Discharge capacity (mAh /g)
1	291	826
10	280	280
25	262	268
50	260	261
75	247	244
100	246	240
125	243	243
150	236	237
200	229	237
225	231	227
250	228	221
275	220	212
300	223	222
325	217	210
350	210	208

Table S2 Cycling performance of CPC-850 anode upon extended cycles at 1000 mA g^{-1} current density condition vs. Na^+/Na

Cycle No.	Charge capacity (mAh g^{-1})	Discharge capacity (mAh g^{-1})	Coulombic efficiency (in %)
1	130	134	95
2	130	131	99
50	120	121	98
100	127	130	100
200	125	125	99
300	117	118	99
400	114	114	98
500	113	114	99
600	117	121	99
700	107	107	100
800	105	105	99
900	100	100	98
1000	114	114	99

Table S3 Comparison of electrochemical performance of CPC anode in Sodium ion batteries with some other recently reported biomass derived carbon materials as anode

Carbon material	Capacity (mAh g^{-1})	Rate capability (mAh g^{-1})	Reference
Microporous carbon derived from coir pith waste (CPC-850)	• 240 @ 0.05 A g^{-1} in 150th cycle • 110 @ 1A g^{-1} for 1000 cycles	• 110 @ 2 A g^{-1} (5.37C) • 54 mAh g^{-1} @5 A g^{-1} (13.44C)	This work
Furfuryl alcohol derived spherical carbon	110 @ 0.2 Ag^{-1} for 1000 cycles	67 @ 1 A g^{-1}	[S1]
Human Hair derived carbon	230 @ 0.05 Ag^{-1}	50 @ 2A g^{-1}	[S2]
Garlic Peel derived carbon	200 at 0.1 A g^{-1}	90 @ 1 A g^{-1}	[S3]
Coconut oil derived carbon	203 at 0.1 A g^{-1} in 50th cycle	82 @ 1 A g^{-1}	[S4]

References:

[S1] D. Zhou, M. Peer, Z. Yang, V.G. Pol, F.D. Key, J. Jorne, H.C. Foley, C.S. Johnson, *J. Mater. Chem. A*, 2016, **4**, 6271-6275.

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Table S4 Comparison of electrochemical performance of CPC electrode in EDLC with some other recently reported biomass derived carbon materials

Carbon material	Activation Method	Capacitance ($F\ g^{-1}$)	Energy Density ($W\ h\ Kg^{-1}$)	Electrolyte	Reference
Microporous carbon derived from coir pith waste (CPC-850)	KOH	• 191 @ 0.1A g^{-1} • 128 @ 10 A g^{-1} • 102 @ 30 A g^{-1}	• 6.63 @ 0.1A g^{-1} • 4.44 @ 0.1A g^{-1} • 2.43 @ 0.1A g^{-1}	6 M KOH	This work
Broad beans shells derived carbon	KOH	129 @ 10 A g^{-1}	-	6 M KOH	[S5]
Rice husk derived carbon	KOH	147 @ 0.1A g^{-1}	5.11 @ 0.1A g^{-1}	6 M KOH	[S6]
Natural wood derived carbon	KOH	200 @ 50 mV/s	-	6 M KOH	[S7]
Waste Paper derived carbon	KOH	95 @ 25 mV/s	-	6 M KOH	[S8]
Scrap waste tire derived carbon	H_3PO_4	120 @ 1A g^{-1}	-	6 M KOH	[S9]

References:

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