Electronic Supplementary Material

Electrospun porous carbon nanofibers derived from bio-based phenolic resins as free-standing electrodes for high-performance supercapacitors

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Table S1. Average molecular weights of the lignin, PDL, PDLF and PF resins.

	M_n/(g/mol)	M_w/(g/mol)	M_w/M_n
Lignin	/	10000	/
PDL	754	1002	1.33
PDLF	1366	4624	3.39
PF	1024	3000	2.93

Table S2. DSC scanning thermodynamic parameters of the PDLF and PF at different heating rates.

Sample	Peak temperature/(°C)				Curing temperature/(°C)		Kissinger	Crane
	Heating rate/(°C·min^{-1})				T_p	T_f	E_a	n
	5	10	15	20				
PDLF	139	147	155	160	133	155	89.21	0.78
PF	170	182	194	205	158	189	80.45	0.72

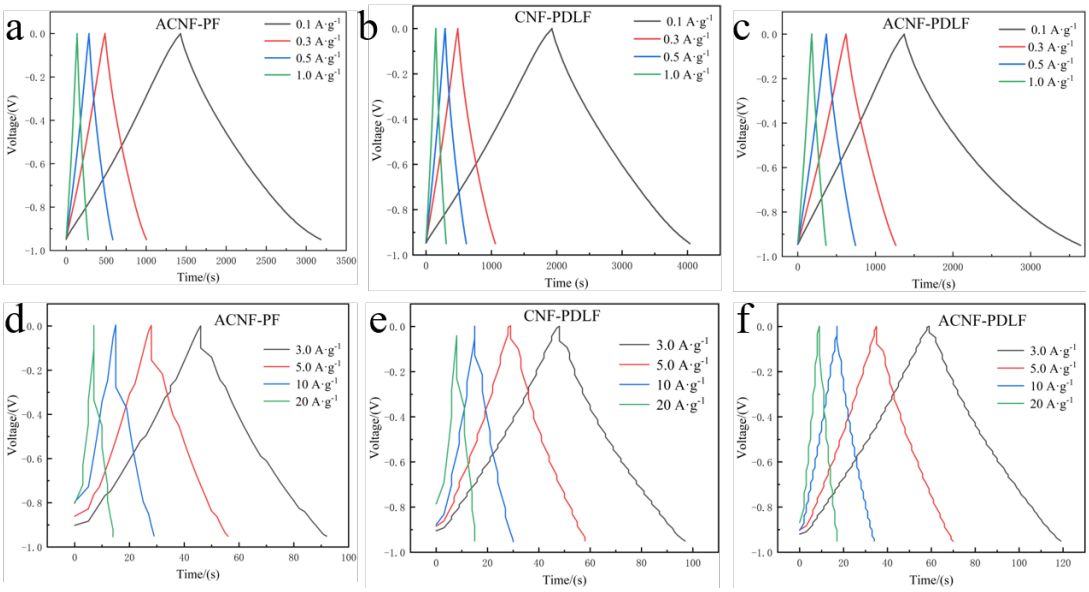

Fig S1. GCD curves of ACNF-PF (a, d), CNF-PDLF (b, e) and ACNF-PDLF (c, f) electrode materials at current density of 0.1, 0.3, 0.5, 1, 3, 5, 10 and 20 $A \cdot g^{-1}$.

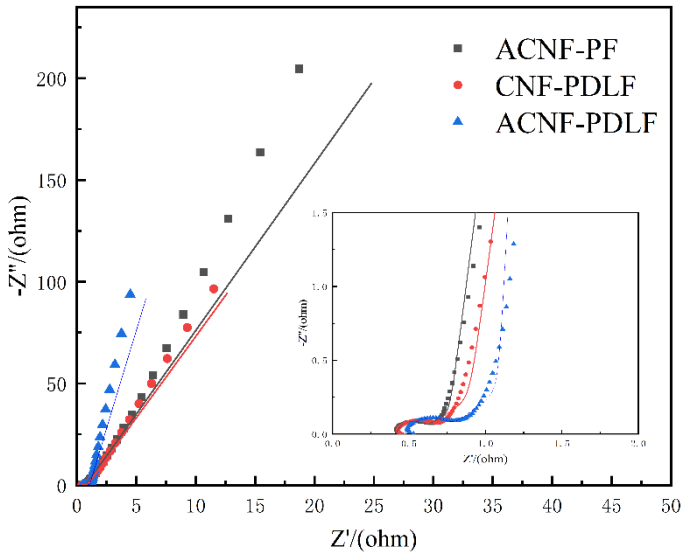

Fig S2. Nyquist impedance plot of ACNF-PF, CNF-PDLF and ACNF-PDLF. The inset is the enlarged high-frequency region of the plots. The symbols and curves represented the original data and the fitted data, respectively.

EIS analysis: Compared with the experimental data of EIS, the fitted curve has similar charge transfer resistance at high frequency, except the deviation in low frequency regions. This shows that the EIS can accurately analyze the impedance of the material.

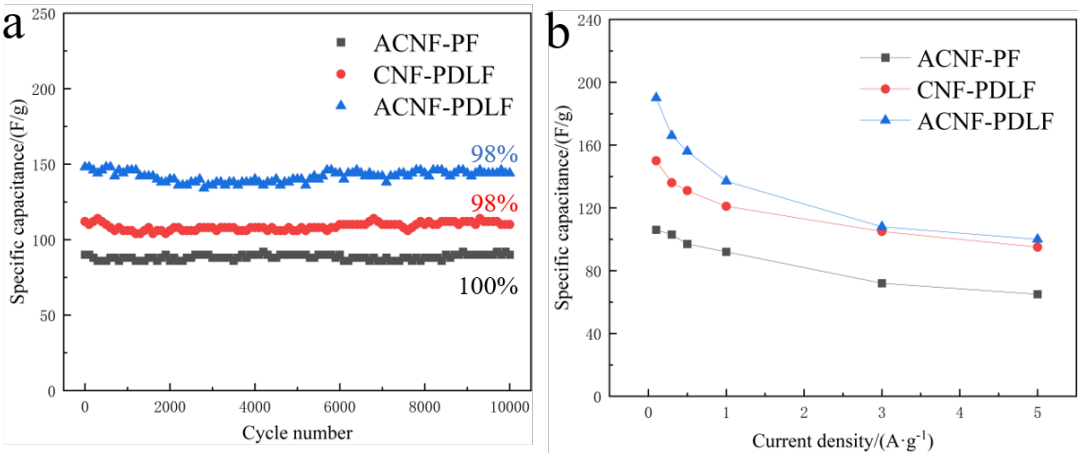

Fig S3. Cyclic performance curve (a) and rate performance (b) of the symmetric cell.

Table S3. The specific capacitance, charge/discharge time of ACNF-PF, CNF-PDLA, and ACNF-PDLF, and energy density and power density of symmetric supercapacitor devices under different current densities were calculated by GCD measurements.

Samples	Three-electrode system			Two-electrode system (symmetric supercapacitor devices)	
	Current density/(A·g^{-1})	Specific capacitance/(F·g^{-1})	discharge/charge time/(s)	Power density/(W·kg^{-1})	Energy density/(Wh·kg^{-1})
ACNF-PF	0.1	185	1753/1430	100	14.72
	0.3	164	518/486	300	14.31
	0.5	156	297/286	500	13.47
	1	151	143/137	1000	12.78
	3	145	46/46	3000	9.99
	5	147	28/28	5000	9.03
	10	147	14/15	/	/

	20	147	7/7	/	/
	0.1	222	2111/1927	100	20.83
	0.3	181	574/487	300	18.89
	0.5	171	324/293	500	18.19
	1	167	159/151	1000	16.81
CNF-PDLF	3	155	49/48	3000	14.58
	5	153	29/29	5000	13.19
	10	147	14/16	/	/
	20	147	7/8	/	/
	0.1	238	2270/1372	100	26.39
	0.3	202	641/622	300	23.06
	0.5	197	375/369	500	21.67
	1	192	183/181	1000	19.03
ACNF-PDLF	3	189	60/59	3000	14.99
	5	184	35/35	5000	13.89
	10	179	17/17	/	/
	20	168	8/9	/	/