Supporting information

Double-core-shell polysaccharide polymer networks for highly flexible, safe and durable supercapacitors

Pengzhen Wang, [a] Zhaoting Meng, [b] Xiaoxiao Wang, [a] Zhihui Zhao, [a] Yanghou Wang,

[a] Fengyu Quan, [a] Weiliang Tian, [c] Chao Yang, [a] Kewei Zhang *[a] and Yanzhi Xia *[a]

[a.] State Key Laboratory of Bio-Fibers and Eco-Textiles, Collaborative Innovation Center for Marine Biomass Fibers, Materials and Textiles of Shandong Province, College of Materials Science and Engineering, Institute of Marine Biobased Materials, Qingdao University, Qingdao 266071, P. R. China

[b.] School of Chemical Engineering, Shandong Institute of Petroleum and Chemical Technology, Dongying 257061, P. R. China

[c.] Key Laboratory of Chemical Engineering in South Xinjiang, College of Life Science, Tarim University, Alar 843300, P. R. China

*Corresponding authors, E-mail: zhkw@qdu.edu.cn (K. Zhang); xiayz@qdu.edu.cn (Y. Xia)

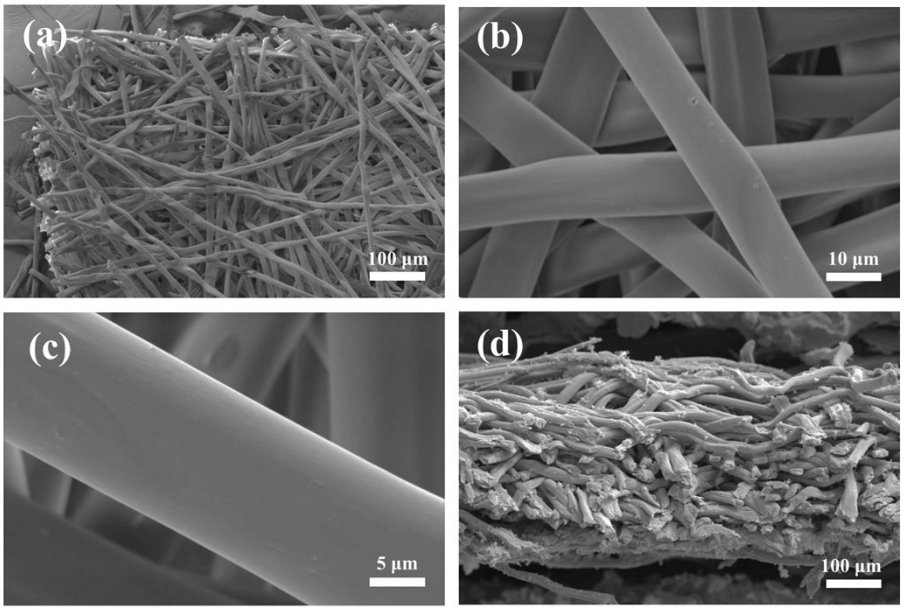

Fig. S1. (a-c) SEM image of PF. (d) Cross-sectional SEM images of $SCSP_p$.

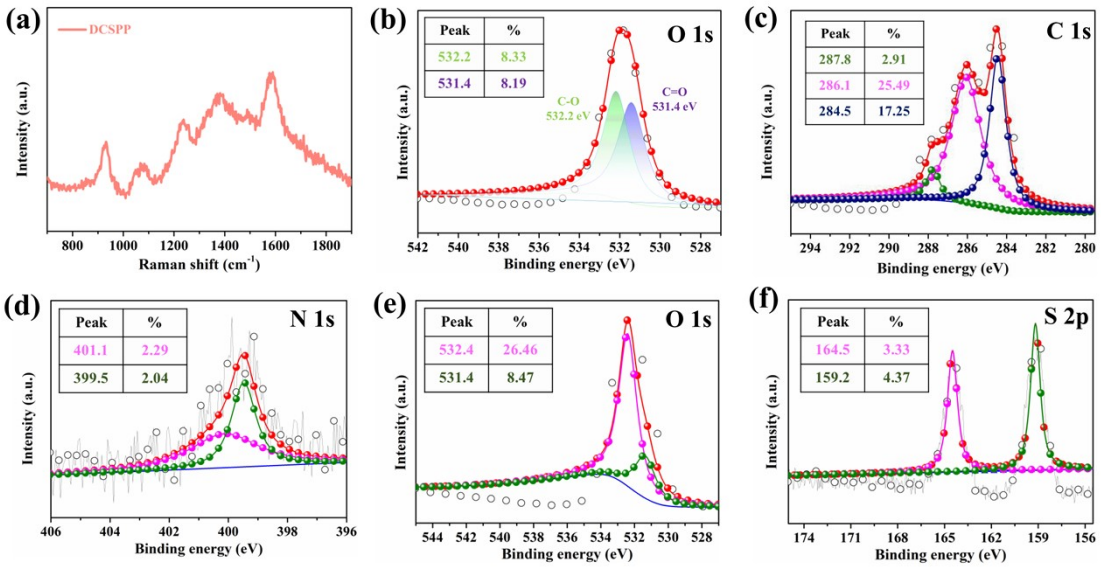

Fig. S2. (a) Raman spectra of DCSPP. (b) O 1s XPS spectra of DCSPP. (e-f) C 1s, N 1s O 1s and S 2p XPS spectra of PF.

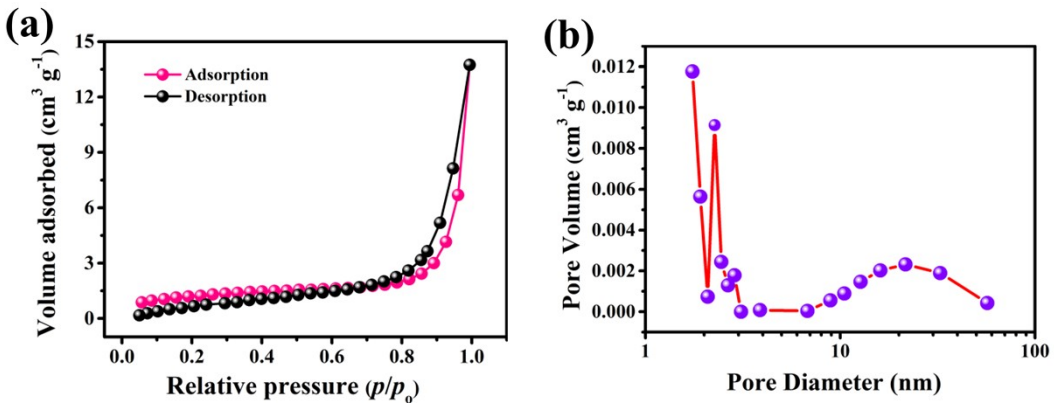

Fig. S3. (a) Nitrogen adsorption-desorption isotherm and (b) the pore size distribution of the DCSPP sample.

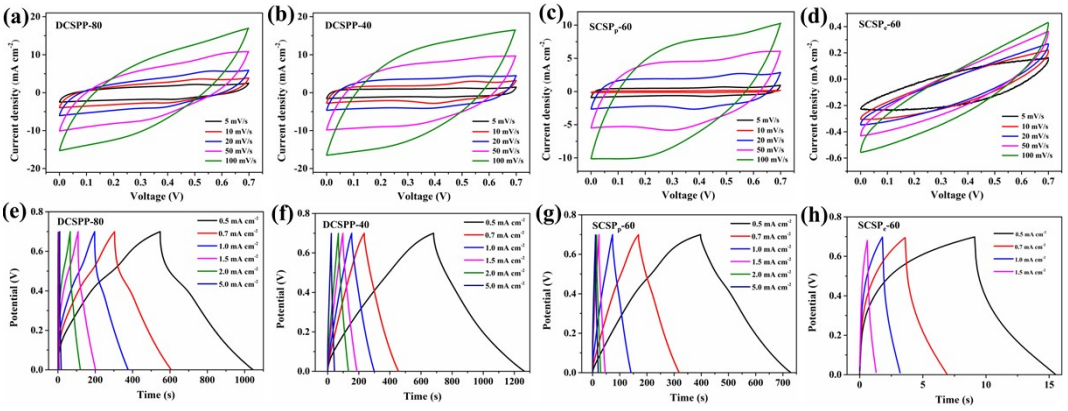

Fig. S4. (a-d) CV curves of the DCSPP-80, DCSPP-40, SCSP$_p$-60 and SCSP$_e$-60 at different scan rates. (e-h) GCD curves of the DCSPP-80, DCSPP-40, SCSP$_p$-60 and SCSP$_e$-60 at different areal current densities.

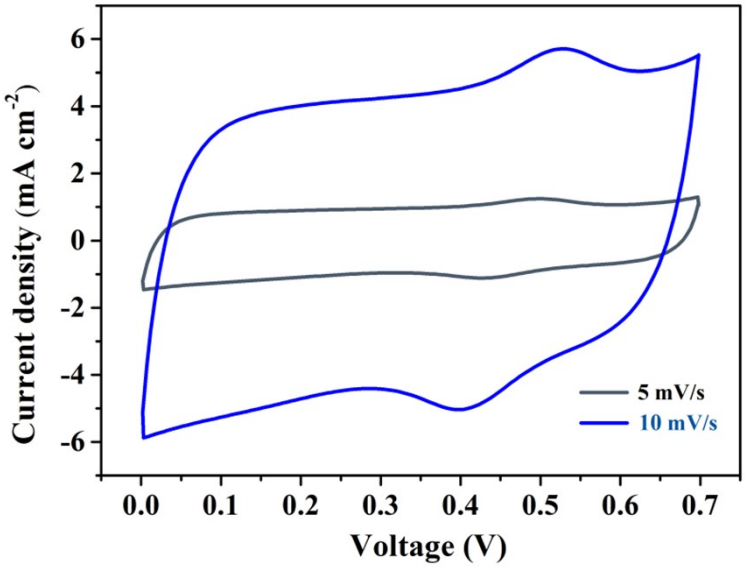

Fig. S5. CV curves of the DCSPP at different scan rates.

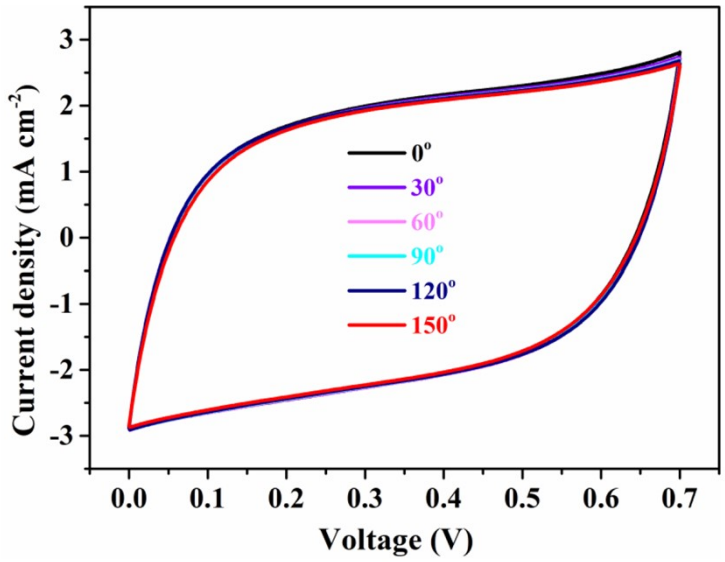

Fig. S6. CV curves of the FSS-SCs device measured at different bending angles.

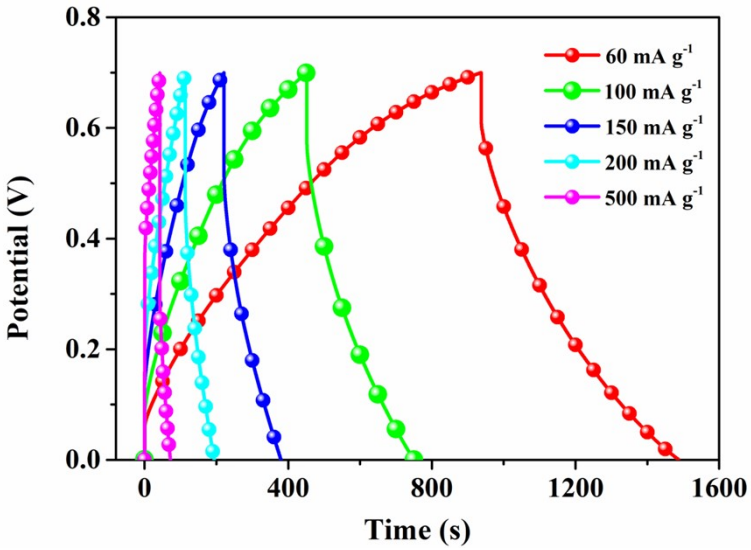

Fig. S7. GCD profiles of the FSS-SCs device at different gravimetric current densities.

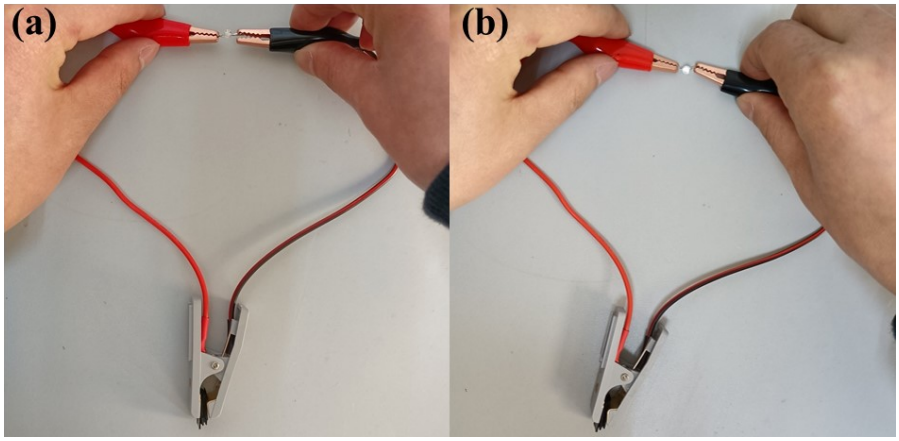

Fig. S8. Photograph shows that a LED lamp can be lit by 5 devices in series.

Table S1 The conductivity results of $SCSP_e$, $SCSP_p$ and DCSPP.

Sample	Thickness (μm)	area (m^2)	Resistance (Ω)	Conductivity ($S\ m^{-1}$)
$SCSP_e$	182.1	2.0×10^{-4}	792.0	0.001
$SCSP_p$	135.7	2.0×10^{-4}	130.0	0.005
DCSPP	192	2.0×10^{-4}	17.6	0.055

Table S2 XPS peak fitting results of PF and DCSPP.

Sample	C (at. %)			N (at. %)		S (at. %)			O (at. %)		Ca (at. %)
	C=O	C-O	C-C	-NH^+-	-NH-	C-S	C=S	SO_X	C=O	C-O	
PF	2.91	25.49	17.25	2.29	2.04	3.33	4.37		8.47	26.46	7.78
DCSPP	3.78	16.09	35.26	6.00	18.72	0.90	1.29	0.17	8.19	8.33	0.72

Table S3 The specific capacity of DCSPP at different scan rates and areal current densities.

Table S3.1

Scan rate (mV s^{-1})	5	10	20	50	100
C_A (mF cm^{-2})	430.6	392.2	321.9	245.2	167.2

Table S3.2

I (mA cm^{-2})	0.3	0.5	1	1.5	2	2.5	3	5	7	9	10	20
C_A (mF cm^{-2})	491.9	456.3	424.6	405.4	391.4	379.7	371.6	342.9	321.6	303.4	295.7	245.7

Table S4 Areal capacitance and energy density of the reported flexible solid-state supercapacitors.

Device	C_A (mF cm^{-2})	E_A (μWh cm^{-2})	P_A (μW cm^{-2})	Ref.
the FSS-SCs	57.9	3.11	175	This work
MSCs	2.47	0.22	370	1
VP-G	22.4	0.18	11	2
MSCs	52	2.62	600	3
MSC	43	0.11	158	4
MSCs	8.19	0.51	40	5
C_{INTER}	8.9	0.0097	2.5	6
$Ti_3C_2T_x$//SWCNT	0.48	0.05	2.4	7
RuO_2//PEDOT:PSS-only	1.06	0.053	147	8
ipG-GQDs-MSC	0.00909	0.727	83.4	9
Ag NWs/$Ni(OH)_2$-PEIE/PEDOT:PSS	28.3	0.074	3.2	10

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