Electronic Supplementary Information (EIS) Material for New Journal of Chemistry

Phosphorus and nitrogen co-doped porous carbon derived from fish scale for high performance supercapacitors

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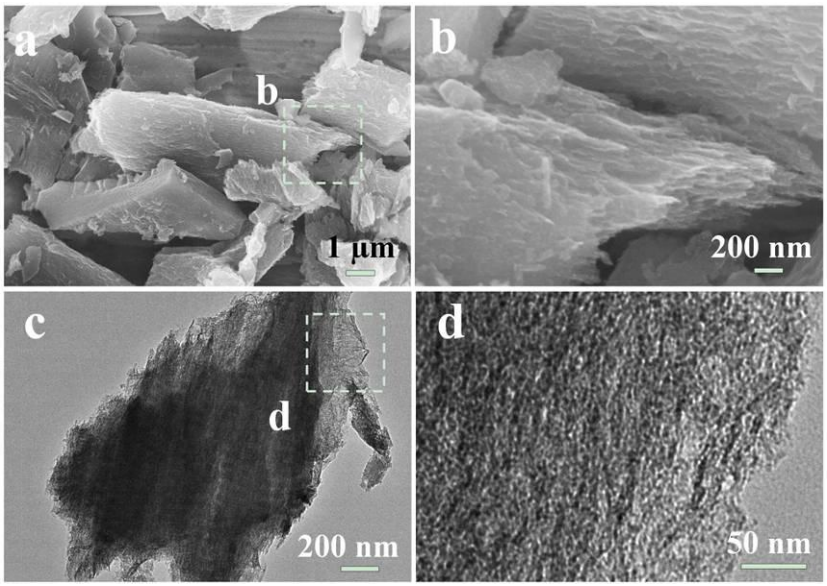

Fig. S1 SEM images (a, b) and TEM images (c, d) of SC.

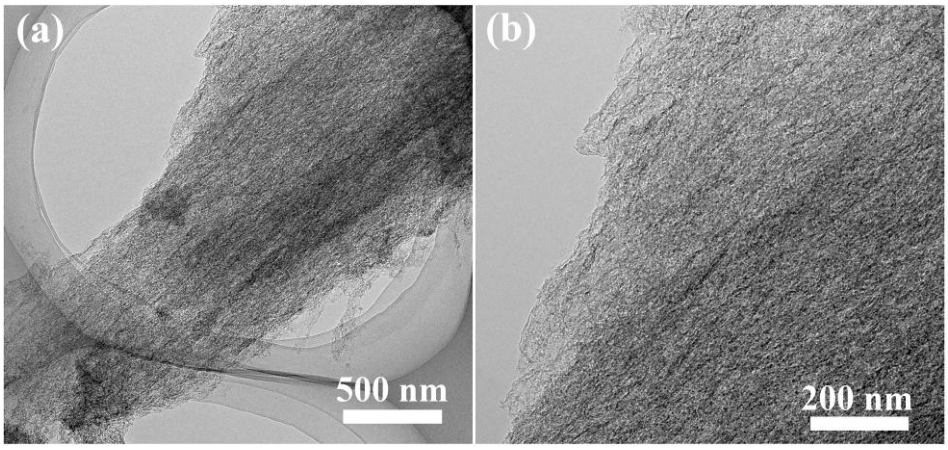

Fig. S2 TEM images of SAC-1.

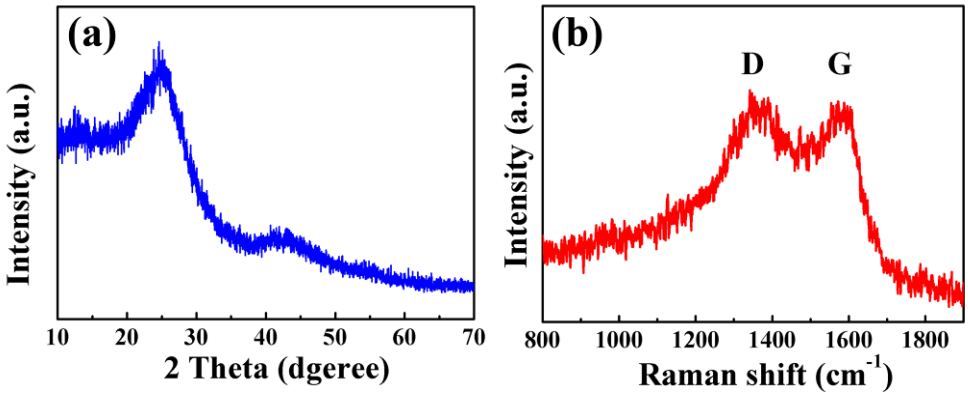

Fig. S3 (a) XRD pattern and (b) Raman spectra of SAC-1.

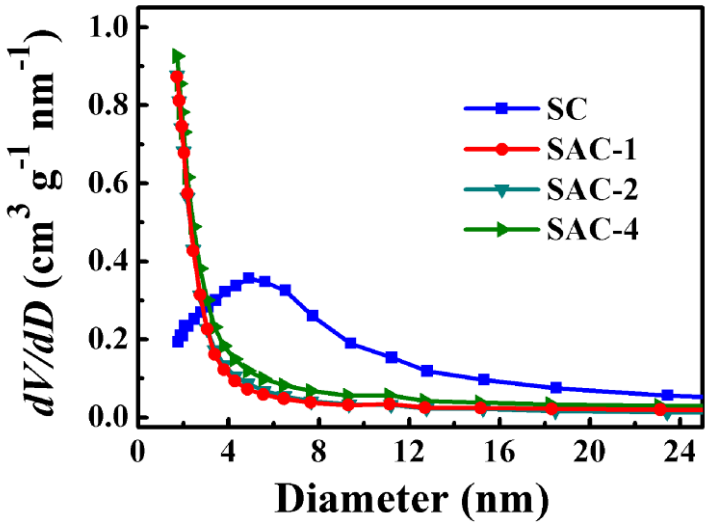

Fig. S4 PSD of SC and different SAC samples.

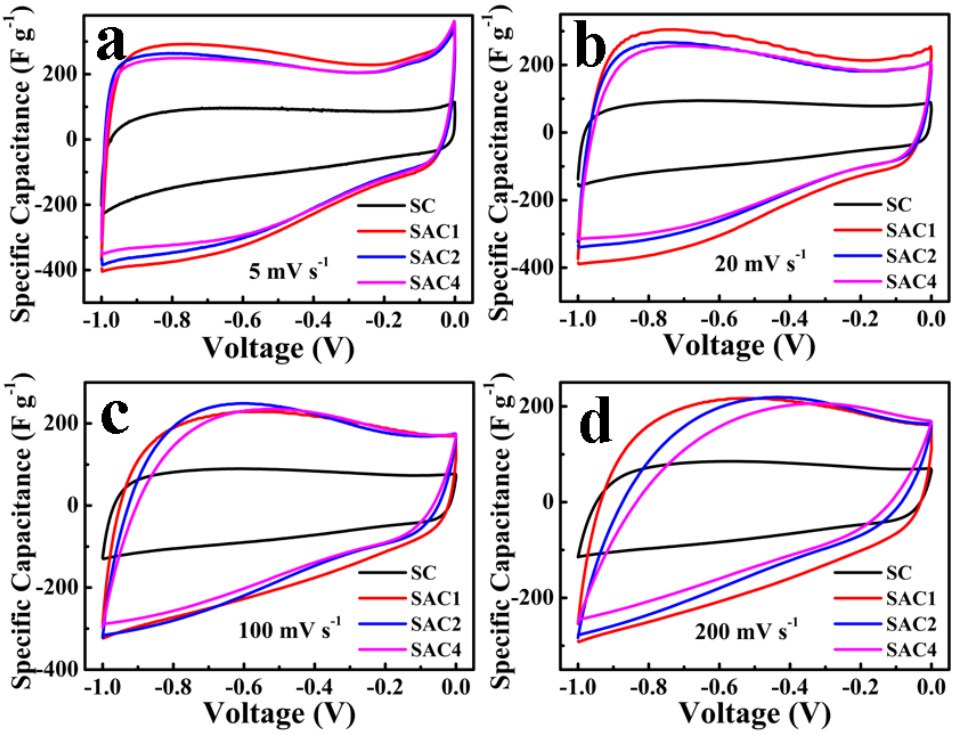

Fig. S5 Cyclic voltammograms of SC, SAC-1, SAC-2 and SAC-4 at a scan rate of (a) 5 mV s^{-1}, (b) 20 mV s^{-1}, (c) 100 mV s^{-1}, and (d) 200 mV s^{-1}.

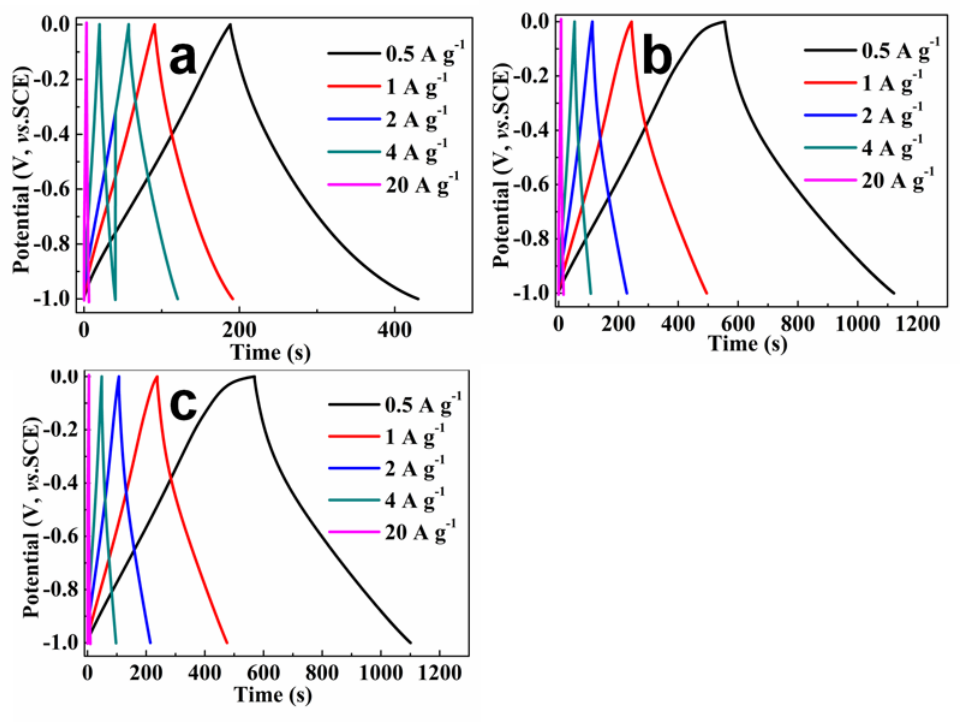

Fig. S6 Galvanostatic charge–discharge curves at different current densities in 6 M KOH of (a) SC, (b) SAC-2 and (c) SAC-4.

Table S1. Weight percentage of element and approximate distribution of N functional groups in different samples.

	N%[a]	C%[a]	N%[b]	P%[b]	O%[b]	N-Q[c]	N-5[c]	N-6[c]	N-X[c]
SC	7.24	82.75	6.88	1.12	5.95	37	39	12	12
SAC-1	5.97	78.32	5.74	0.98	12.76	23	47	23	7
SAC-2	4.83	77.84	4.84	0.78	13.90	24	41	27	8
SAC-4	3.42	75.34	3.36	0.41	17.69	23	46	24	7

a: The contents of N and C obtained from the elemental analysis results;
b: The contents of N, P, O and C obtained from the XPS results;
c: Approximate distribution of N functional groups obtained by fitting the N 1s core level XPS spectra.

Compared with the results of elemental analysis, some discrepancies on each activation ratios, but generally the same tendency is shown with increasing the activation ratios. These discrepancies on the results are attributed to the atomic ratios near the surface of carbons due to the thin penetration depth of X-rays.