Supporting information

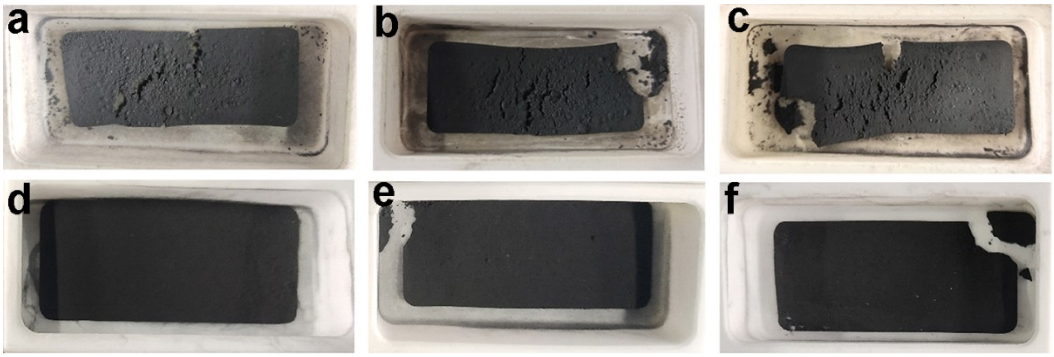

Fig. S1. Optical photograph of (a) DHC-3; (b) DHC-6; (c) DHC-9; (d) THC-3; (e) THC-6 and (f) THC-9.

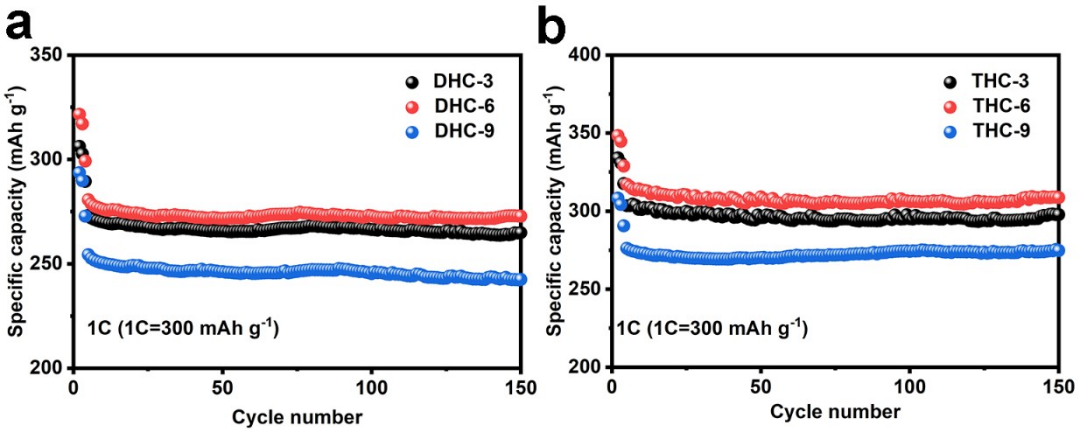

Fig. S2. Electrochemical properties of (a) DHC-3, DHC-6 and DHC-9 at 0.1 C; (b) THC-3, THC-6 and THC-9 at 0.1 C.

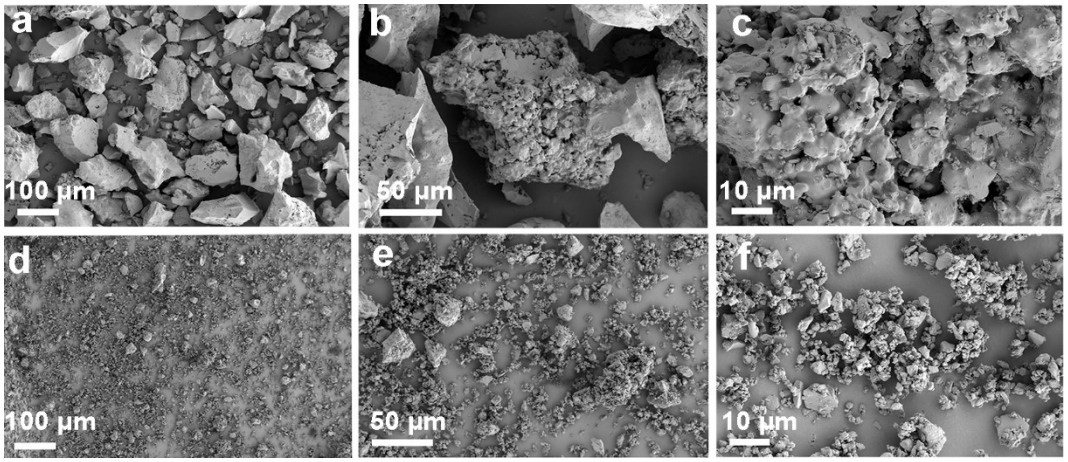

Fig. S3. (a-c) SEM of DHC-6; (d-f) SEM of THC-6.

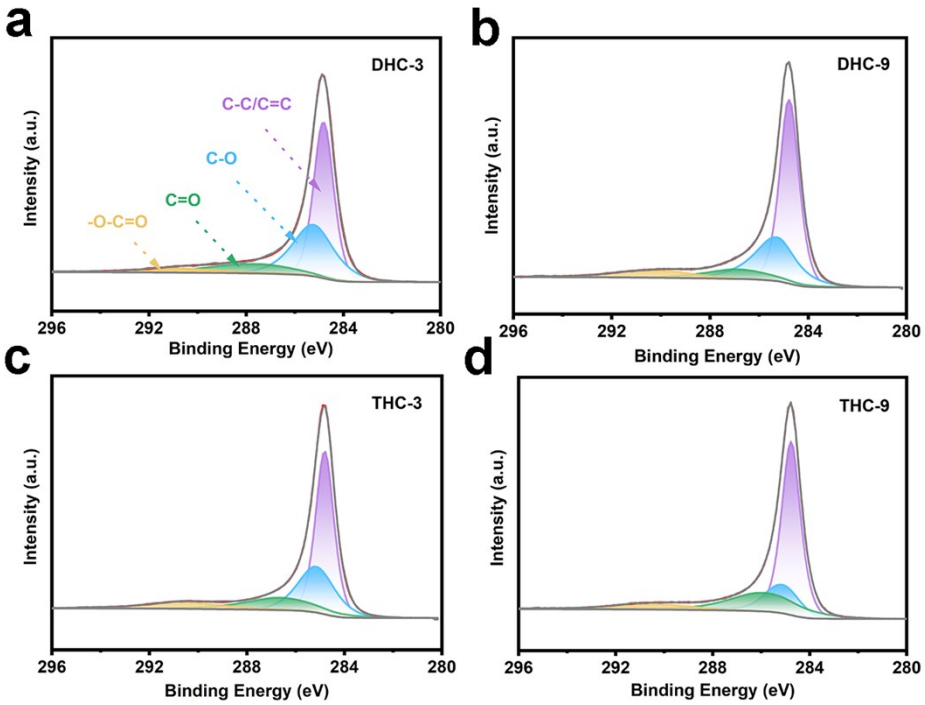

Fig. S4. C 1s High-resolution XPS spectrum of (a) DHC-3; (b) DHC-9; (c) THC-3 and (d) THC-9.

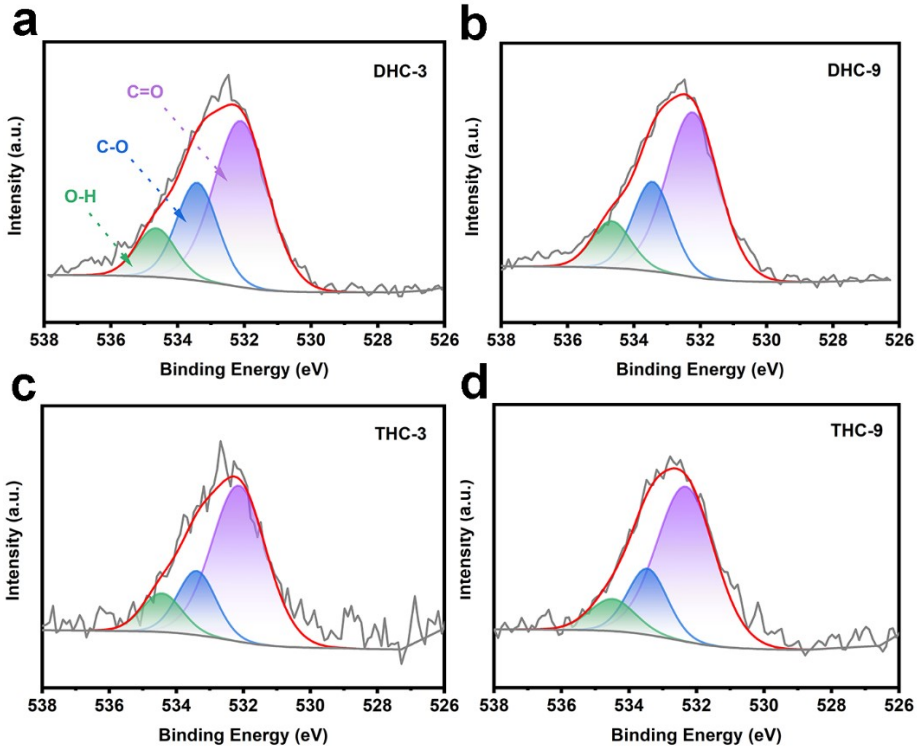

Fig. S5. O 1s High-resolution XPS spectrum of (a) DHC-3; (b) DHC-9; (c) THC-3 and (d) THC-9.

Table S1. XPS fitted parameters of the C 1s spectra.

	C-C/C=C(wt.%)	C-O(wt.%)	C=O(wt.%)	-O-C=O(wt.%)
DHC-3	52.32	28.61	12.40	6.67
DHC-6	48.45	33.93	12.00	5.62
DHC-9	53.63	28.56	9.38	8.43
THC-3	49.20	27.70	14.56	8.54
THC-6	51.02	20.79	22.84	5.34
THC-9	54.71	18.30	20.87	6.12

Table S2. XPS fitted parameters of the O 1s spectra.

	C=O(wt.%)	C-O(wt.%)	O-H(wt.%)
DHC-3	60.63	26.28	13.09
DHC-6	61.97	26.40	11.64
DHC-9	61.62	25.19	13.18
THC-3	68.05	19.68	12.27
THC-6	69.04	20.09	10.88
THC-9	68.76	20.07	11.17

Table S3. EA analysis results before pyrolysis.

	C(wt %)	H(wt %)	O(wt %)
DHC-6	76.40	3.20	15.12
THC-6	70.13	2.33	22.53

Table S4. EA analysis results after pyrolysis.

	C(wt %)	H(wt %)	O(wt %)
DHC-6	92.08	0.25	2.13
THC-6	95.04	0.19	1.10

Table S5. Results of element content in XPS total spectrum.

	C(wt %)	O(wt %)
DHC-3	97.08	2.92
DHC-6	97.48	2.52
DHC-9	96.67	3.33
THC-3	99.06	0.94
THC-6	99.12	0.88
THC-9	98.58	1.42

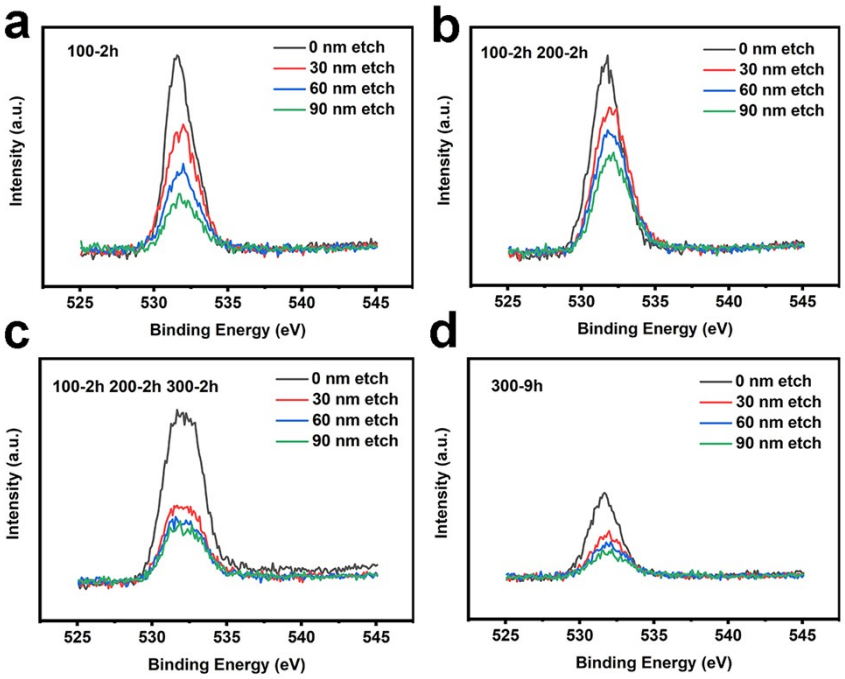

Fig. S6. O 1s XPS depth etching tests of (a) 100-2h; (b) 100-2h 200-2h; (c) 100-2h 200-2h 300-2h and (d) 300-9h.

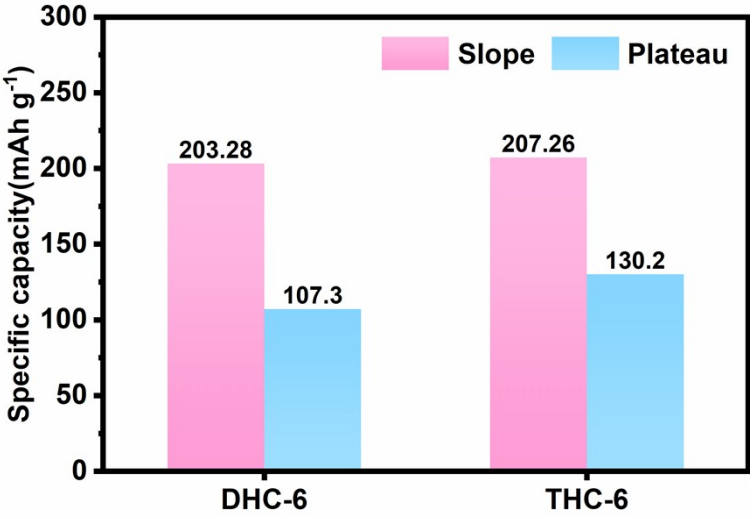

Fig. S7. Capacity contribution of the slop region and plateau region.

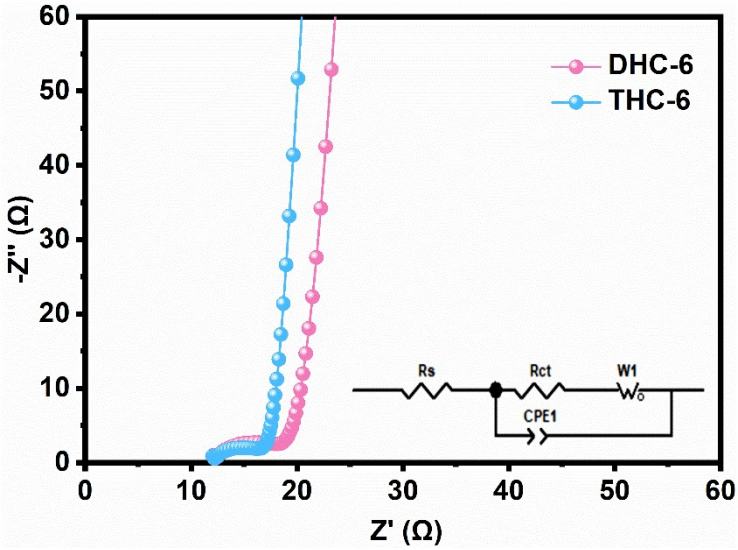

Fig. S8. EIS spectra of DHC-6 and THC-6 samples before cycling(inset: corresponding equivalent circuit diagram).

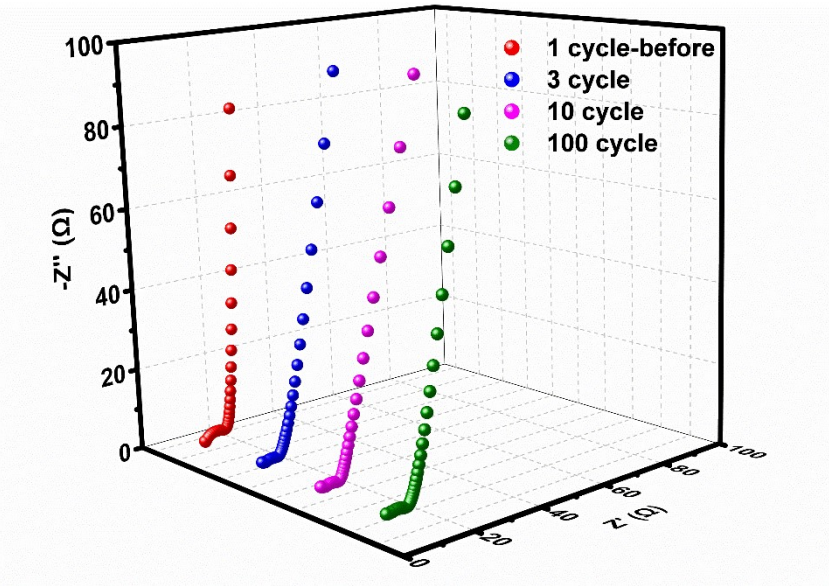

Fig. S9. The Nyquist plots of the DHC-6 electrode before the cycle, after the 3rd, 30th and 100th cycle.

Table S6. The fitting results of the EIS curves of the DHC-6 electrode under different cyclic states.

	uncycle	3 cycle	30 cycle	100 cycle
R_s (Ω)	12.28	12.40	12.01	11.44
R_{ct} (Ω)	4.559	3.008	3.335	3.710

Table S7. The fitting results of the EIS curves of the THC-6 electrode under different cyclic states.

	uncycle	3 cycle	30 cycle	100 cycle
R_s (Ω)	12.15	10.61	13.33	11.60
R_{ct} (Ω)	3.506	2.689	2.447	3.279

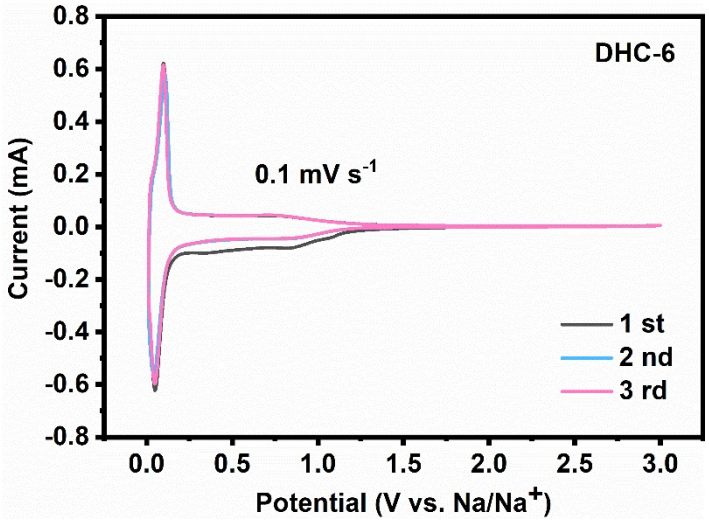

Fig. S10. CV profiles of the DHC-6 electrode at the scan rate of 0.1 mV s^{-1}.

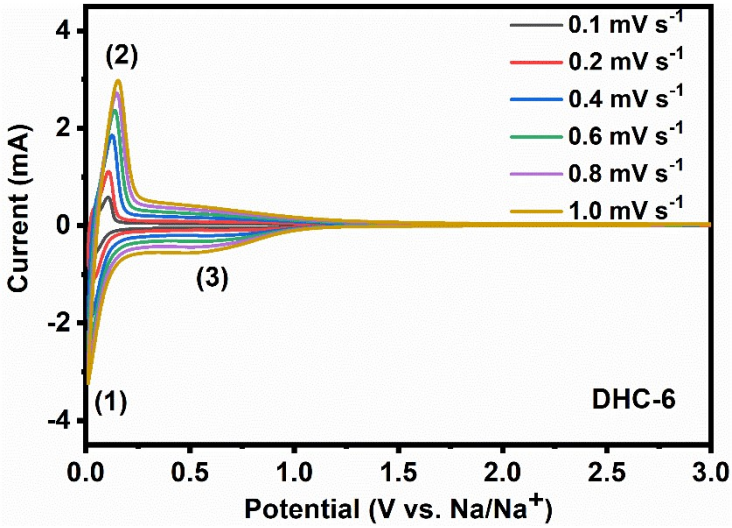

Fig. S11. CV profiles of the DHC-6 electrode at various scan rates.

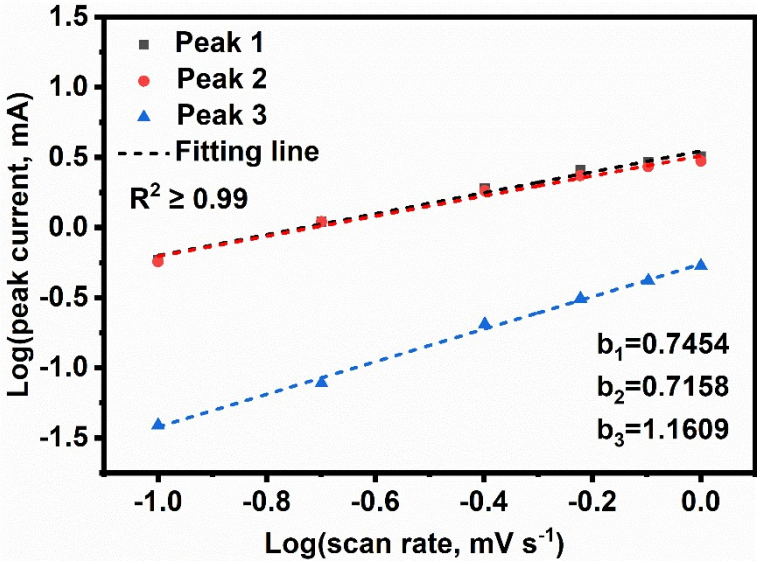

Fig. S12. Log (i) vs log (ν) at different scan rates of the DHC-6 electrode.

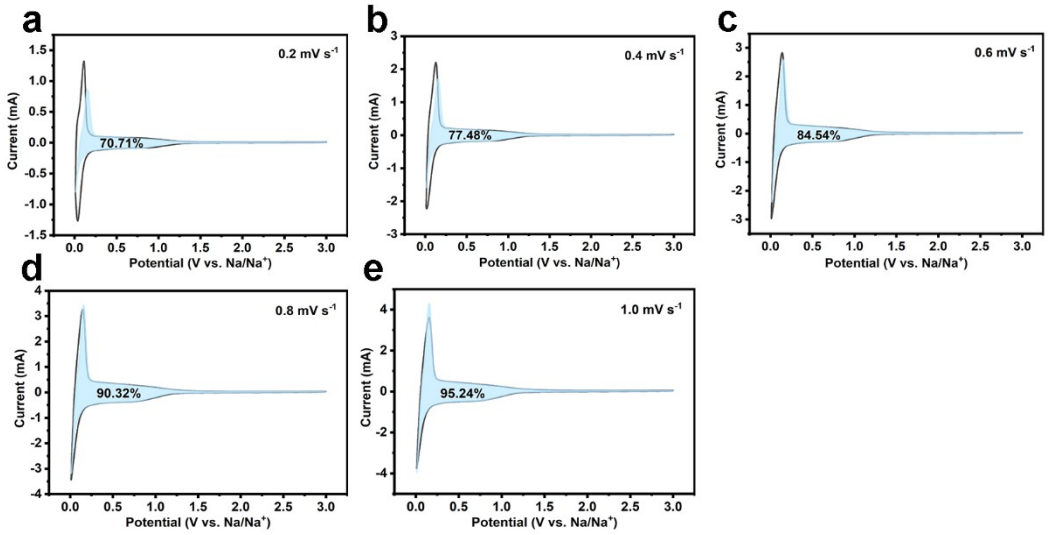

Fig. S13. The pseudocapacitance ratio of the THC-6 electrode at different voltage scan rate.

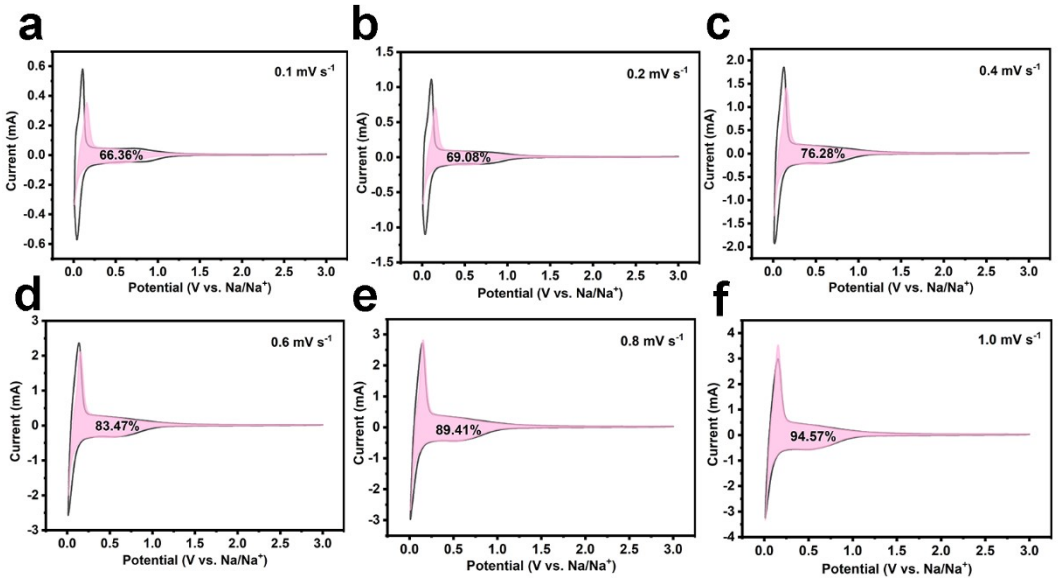

Fig. S14. The pseudocapacitance ratio of the DHC-6 electrode at different voltage scan rate.