Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information

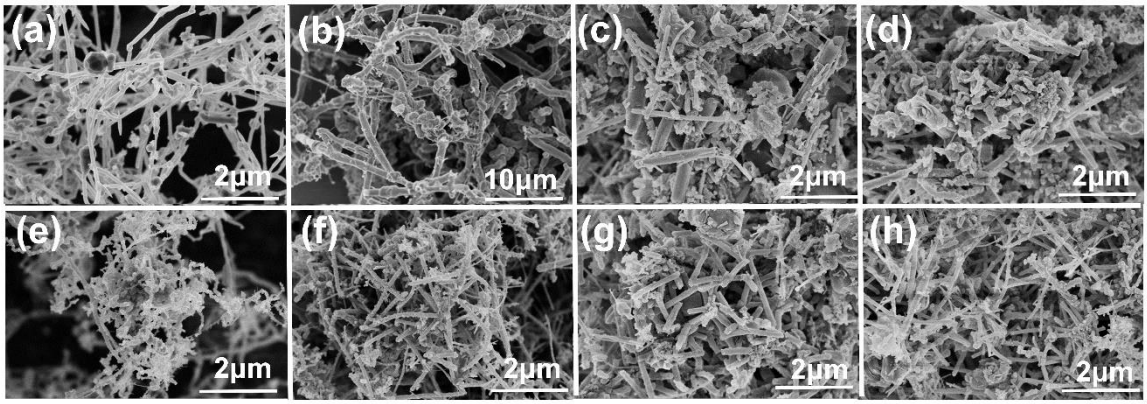

Fig. S1 SEM images of (a) CNT (b) FCNT-0.52 (c) FCNT-0.74 (d) FCNT-0.81 and (e) GCNT (f) FGCNT-0.29 (g) FGCNT-0.59 (h) FGCNT-0.81

Table S1. Elemental compositions of samples measured by EDS

Sample	wt% C	wt% F	wt% O	F/C
CNTs	99.22	-	0.78	-
FCNT-0.52	44.13	54.44	1.43	0.78
FCNT-0.74	40.06	58.57	1.37	0.92
FCNT-0.81	38.65	60.15	1.20	0.98
GCNT	98.43	-	1.57	-
FGCNT-0.29	55.73	42.79	1.49	0.48
FGCNT-0.59	42.54	56.22	1.24	0.83
FGCNT-0.81	38.27	60.03	1.69	0.99

Table S2. Chemical composition of samples determined from XPS spectra

Sample	at%				C1s (%)					
	F	C	F/C	O	C–C	C–O	C=O	O=C–O	–CF	$–CF_2$
CNT		98.23		1.77	79.8	6.8	6.0	7.4		
FCNT-0.52	47	51.4	0.91	1.6	12.9	10	12.96		63.2	1.1
FCNT-0.74	50.08	48.47	1.03	1.45	9.7	6.5	4.2		77.8	1.9
FCNT-0.81	49.62	49.01	1.01	1.37	9.3	4.5	4.4		78.4	3.3
GCNT		97.48		2.52	80.6	6.6	6.2	6.4		
FGCNT-0.29	40.48	58.16	0.70	1.36	31.6	13.3	6.4		47.1	1.6
FGCNT-0.59	47.7	50.86	0.94	1.44	13.5	9.9	7.4		67.5	1.7
FGCNT-0.81	51.08	47.98	1.06	0.94	8.8	7.5	2.3		79.1	2.4

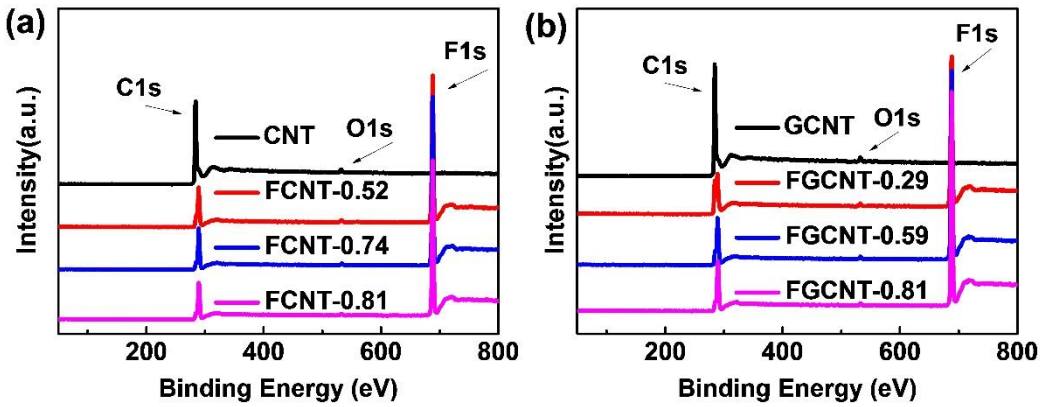

Fig. S2 XPS survey spectra of samples.

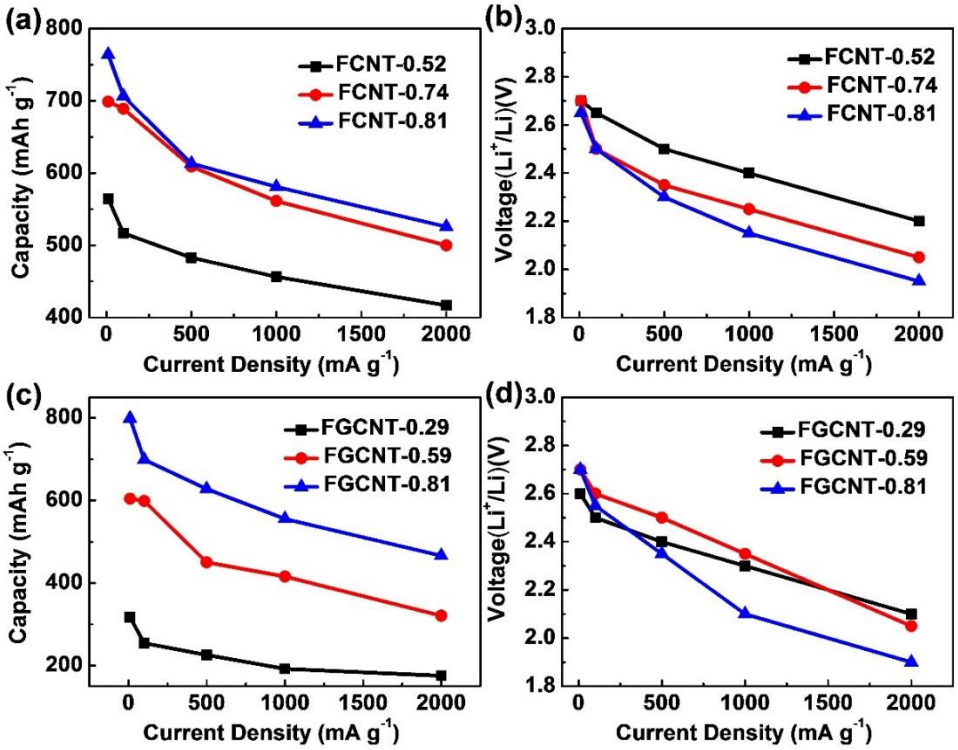

Fig. S3 Comparison of capacity vs. current denesity (C-C curves) of (a) FCNT-x, (b) FGCNT-x. Comparison of voltage vs. current density (C-V curves) of (c) FCNT-x, (d) FGCNT-x.

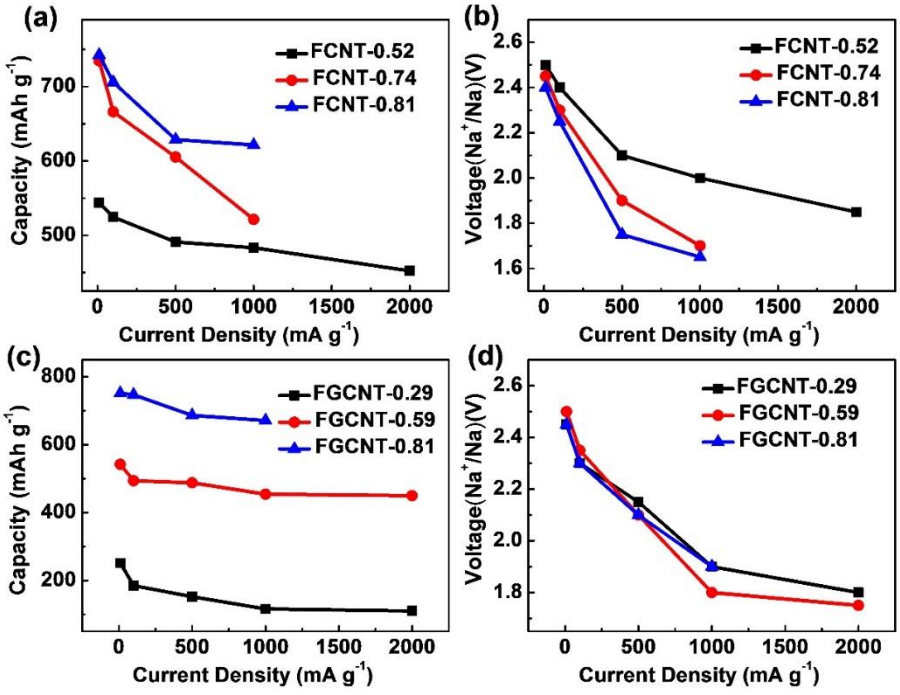

Fig. S4 C-C curves of (a) FCNT-x, (b) FGCNT-x. C-V curves of (c) FCNT-x, (d) FGCNT-x.

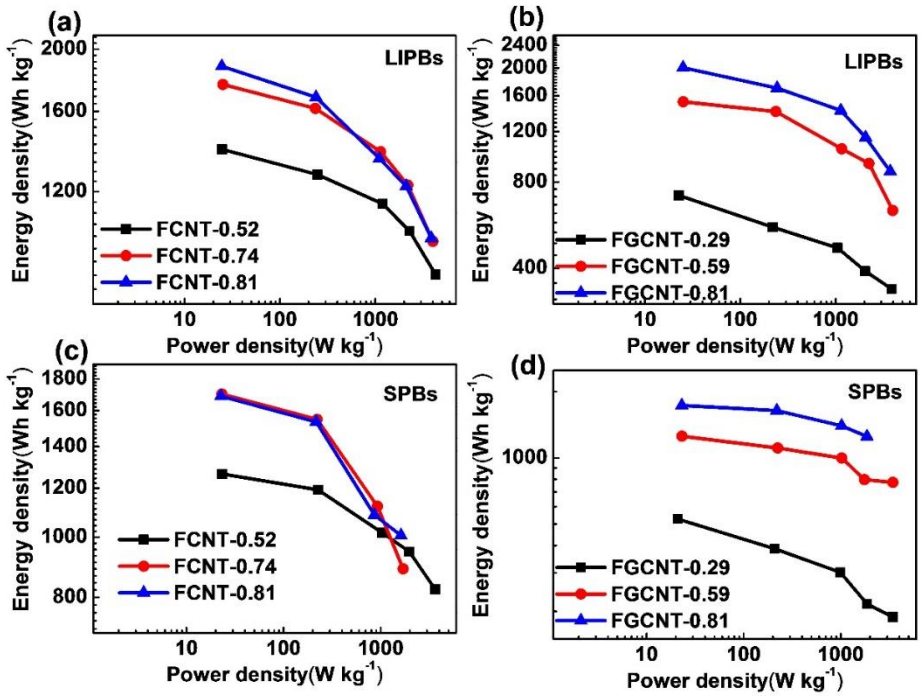

Fig. S5 Comparison of energy density vs. power density (Ragone plots) of samples.

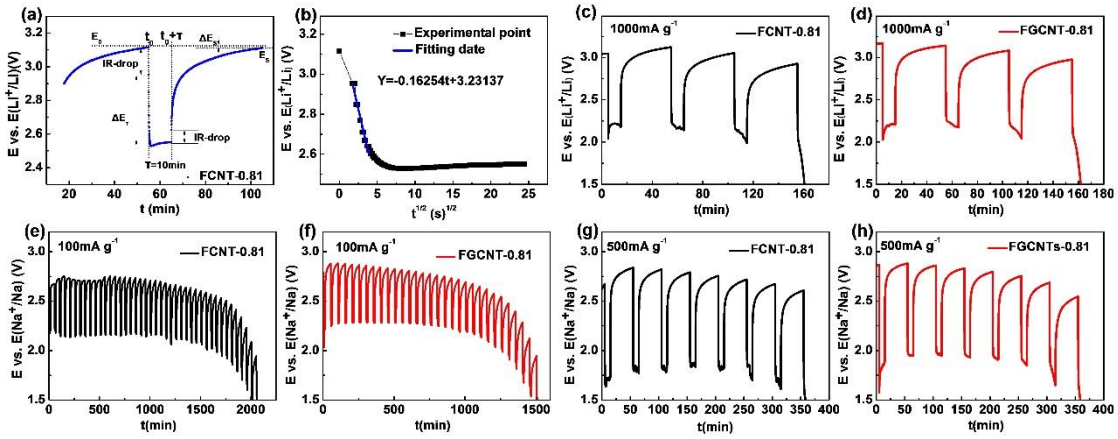

Fig. S6 (a) E vs. t profiles of FCNT-0.81(discharged at 100mA g^{-1} in LPB) cathode for a single GITT during the discharge process at ~3.1 V with a schematic representation of the different profile parameters. (b) Variation of cell voltage for the above titration plotted against $t^{1/2}$ to show the linear fit. The discharge GITT curves of (c) FCNT-0.81, (d) FGCNT-0.81 are measurement at 1000 mA g^{-1} as a function of time in LPBs. The discharge GITT curves of the F-CNTs-0.81 are measurement at (e, f) 100 mA g^{-1} and (g, h) 500 mA g^{-1} as a function of time in SPBs.