Supporting Information

Highly Crystalline Graphite Nanofibers as Anode for High-Performance Potassium-Ion Batteries

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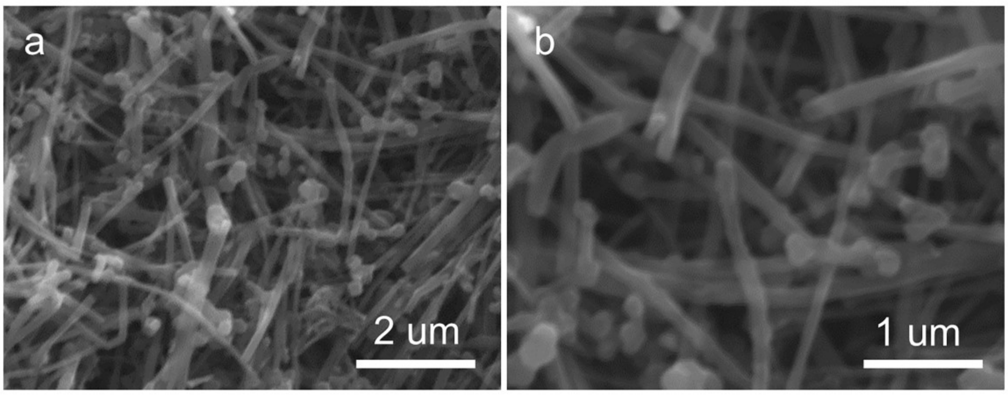

Fig. S1 SEM photos of GNFs electrode.

Tab. S1 Comparison of initial Coulombic efficiency (ICE) of carbon material anode.

Material	ICE
non-tubular/fibrous carbon	
GNT This work	74.33%
rGO [1] Reduced graphene oxide	74.3%
SC [2] Roft carbon	72%
Graphite [3]	64.8%
OMC [4] ordered mesoporous carbon	63.4%
HCSs [5] hard carbon microspheres	61.8%
SP-HC [6] Sichuan pepper hard carbon	58%
MG [7] modified graphite	57.7%
MEG [8] mildly-expanded graphite	52.57%
CNC [9] carbon nanocage	40%
tubular/fibrous carbon	
NCNF [10] hard carbon microspheres	47%
PCM [11] porous carbon microtube	42.6%
CFs [12] Reduced graphene oxide	42.3%
CNTs/MG [13] carbon nanotubes and modified graphite flakes	40.7%
CNTs/GCF [14] carbon nanotube modified graphitic carbon foam	24%
HCNTs [15] hard carbon microspheres	15%

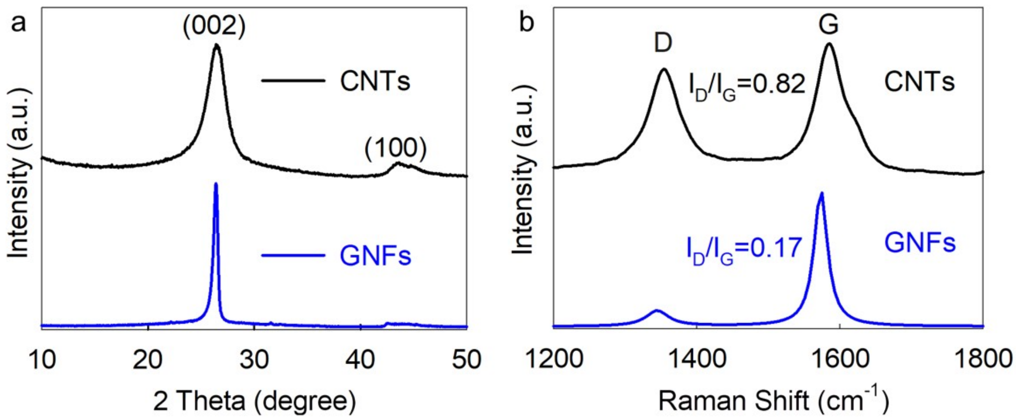

Fig. S2 (a) Comparison of XRD patterns of GNFs and CNTs. (b) Comparison of Raman spectra of GNFs and CNTs.

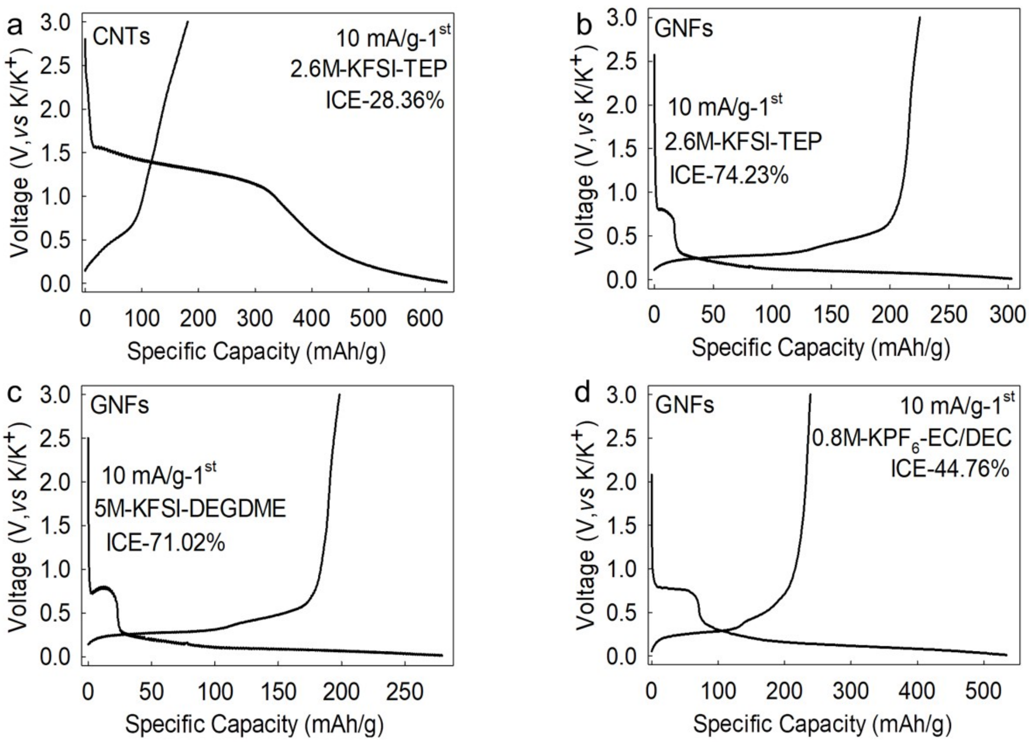

Fig. S3 Initial charge/discharge curves of GNFs and CNTs in different electrolytes. (a) CNTs in 2.6 M-KFSI-TEP electrolyte. GNFs in (b) 2.6 M-KFSI-TEP, (c) 5 M-KFSI-DEGDME, and (d) 0.8 M-KPF6-EC/DEC electrolytes.

Tab. S2 Comparison of specific capacity and average discharge voltage of carbon material anode.

Material	Current density (mA/g)	Specific capacity (mAh/g)	Average voltage(V)
non-tubular/fibrous carbon (without voltage platform)			
SP-HC [6]	27.9	232	0.35
GNCs [16]	50	280	0.5
rGO-a [17]	93	230	0.5
N-HPC [18]	100	292	0.75
N-HCNs [19]	50	201	0.6
SC [2]	25	194	0.25
MG [7]	200	225	0.8
a-CB [20]	50	170	0.75
SNHC [21]	100	214	0.3
Graphite [3]	93	255	0.2
MEG [8]	100	164	0.3
TC [22]	27.9	155	0.37
FLNG [23]	50	320	0.4
non tubular/fibrous carbon (with voltage platform)			
CCHC [24]	83.7	242	0.4
HGHS [25]	100	264	0.08
N-FLG [26]	100	210	0.1
tubular/fibrous carbon (without voltage platform)			
CFs [12]	100	252.8	0.45
HCNTs [15]	100	232	0.5
CNTs/MG [13]	200	245	0.4
PCM [11]	500	410	0.45
TWC-SC-G [27]	30	366	0.45
NCNF [10]	25	248	0.55
fubular/fibrous carbon (with voltage platform)			
CNTs/GCF [14]	100	229	0.3
GNFs(this work)	10	252	0.2

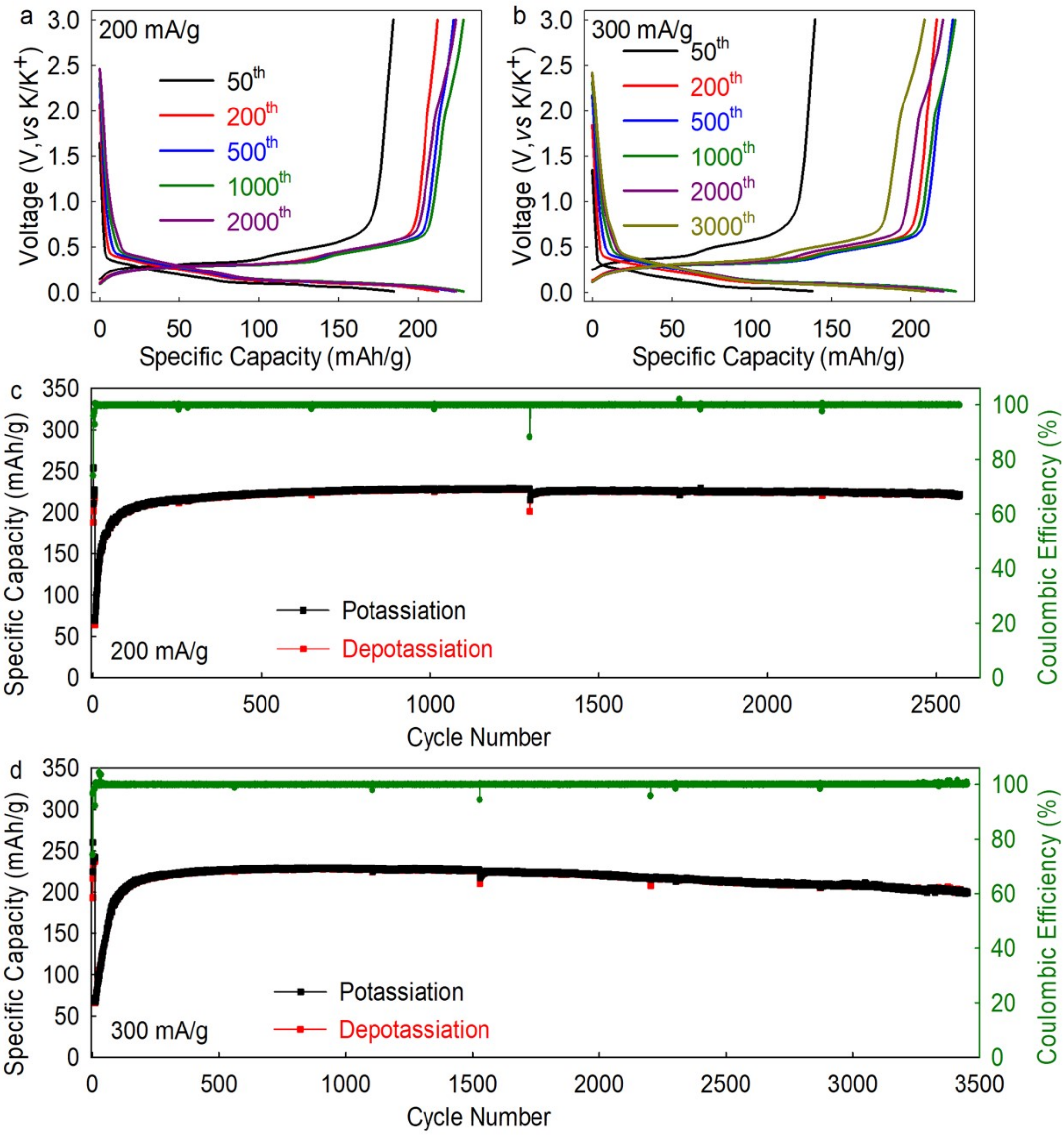

Fig. S4 (a,b) Charge/Discharge curves at 200 mA g^{-1} and 300 mA g^{-1}. (c,d) Cycle stability curves at 200 mA g^{-1} and 300 mA g^{-1}.

Tab. S3 Comparison of cycling performance of carbon materials as Anode for potassium-ion batteries.

Material	**Current density (mA/g)**	**Months**	**Capacity Retention**
tubular/fibrous carbon			
GNFs	100	12.2	99%
CNTs/GCF[14]	500	1.3	96%
HCNTs[15]	100	3.4	90%
CNT-MG[13]	200	2.1	83%
CFs[12]	100	3.6	80%
CNT/SNCF[28]	5000	0.3	80%
TWC-SC-G[27]	100	1.7	77%
NBCNTs[29]	500	1.2	54%
non tubular/fibrous carbon			
CCGM[30]	100	2.0	99%
FLNG-ESM[23]	50	1.1	91%
HGHS[15]	200	1.4	87%
GNCs[16]	50	3.3	82%
rGO-a[17]	93	0.8	78%
SC[2]	25	2.5	75%
SNHC[21]	100	3.4	73%
MEG[8]	100	1.1	72%
N-HCNs[19]	50	1.2	68%
N-FLG[26]	100	0.7	65%
N-HPC[18]	100	3.4	54%

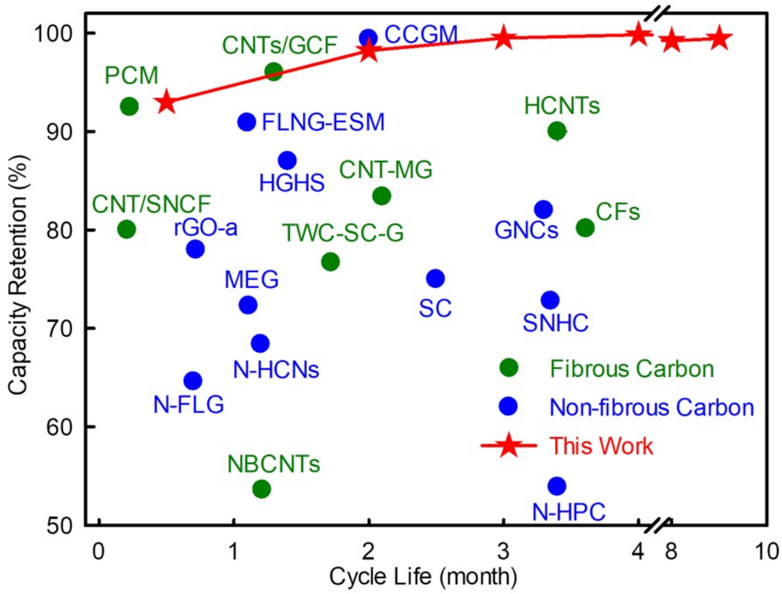

Fig. S5 Comparison of cycle stability of carbon material anode.

Tab. S4 Value of R_s (represent electrolyte resistance), R_f (contact resistance of solid electrolyte interphase), R_{ct} (contact resistance of solid electrolyte interphase).

	Initial	After 3 cycles
R_s (Ω)	18.91	26.93
R_f (Ω)	-	1520
R_{ct} (Ω)	5986	2878

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