

Supporting Information

Flash Joule Heating Enabled Instantaneous Purification and Strengthening of CNT Films for High-Performance Flexible Aluminum-Ion Batteries

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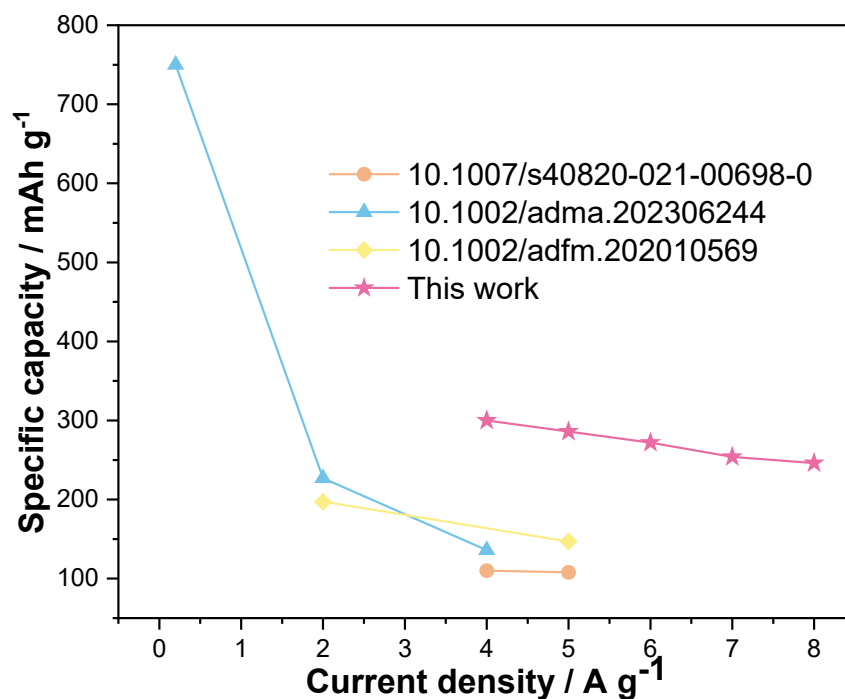


Fig.S1 The specific capacities of CNTF-1700 and typical RABs cathodes were compared.

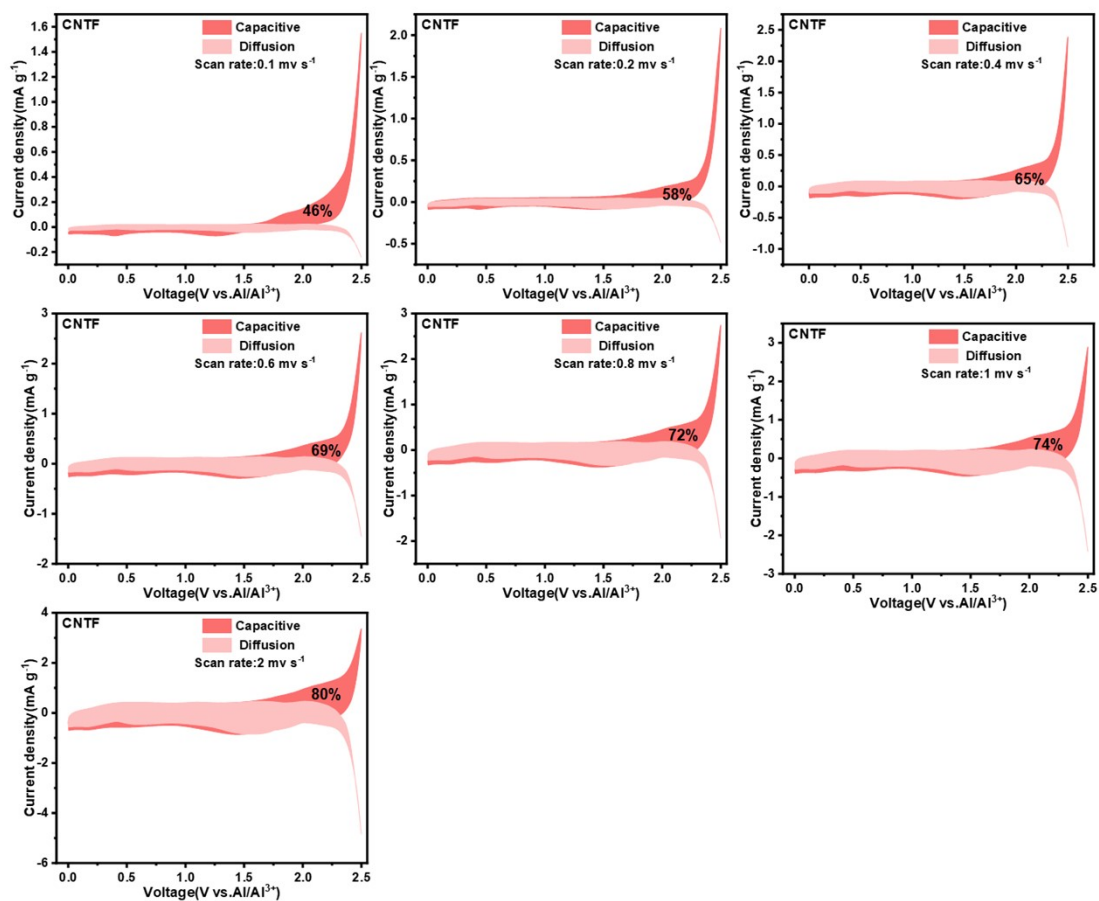


Fig.S2 The pseudocapacitance contribution of CNTF electrode at different scan rates in AIBs.

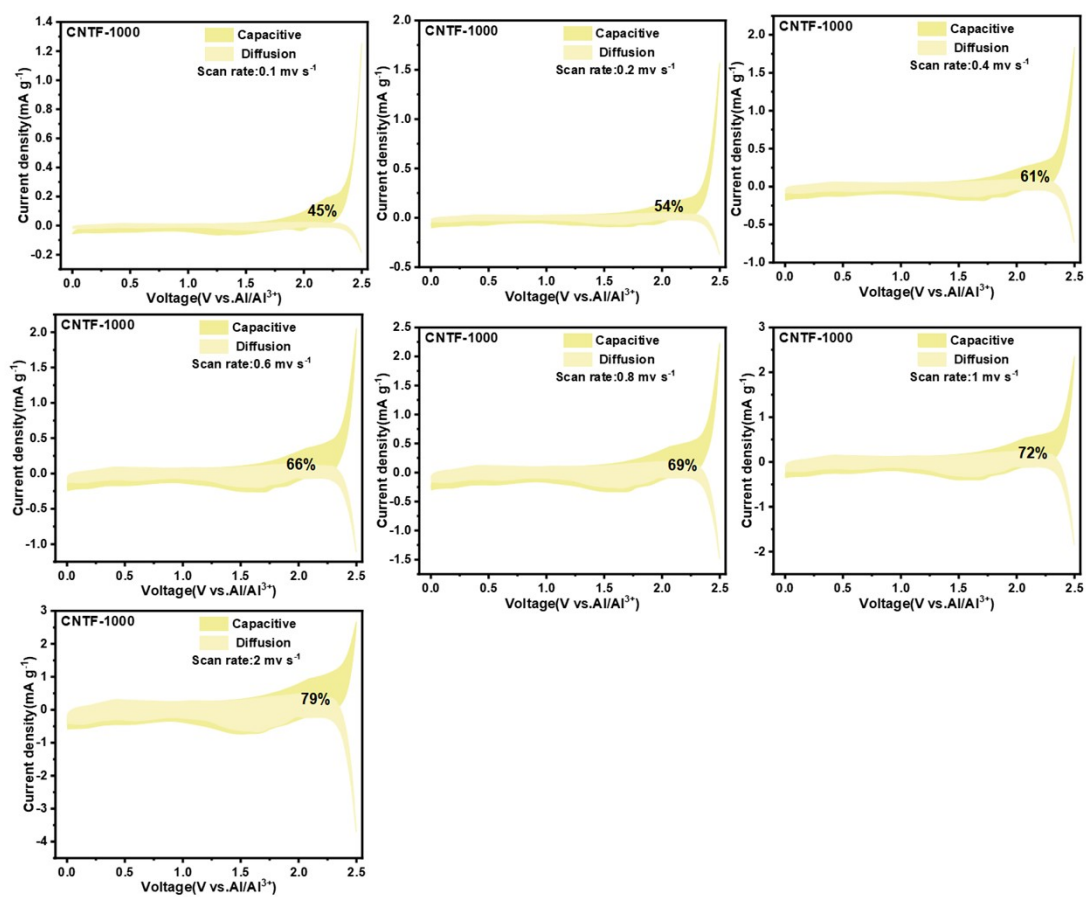


Fig.S3 The pseudocapacitance contribution of CNTF-1000 electrode at different scan rates in AIBs.

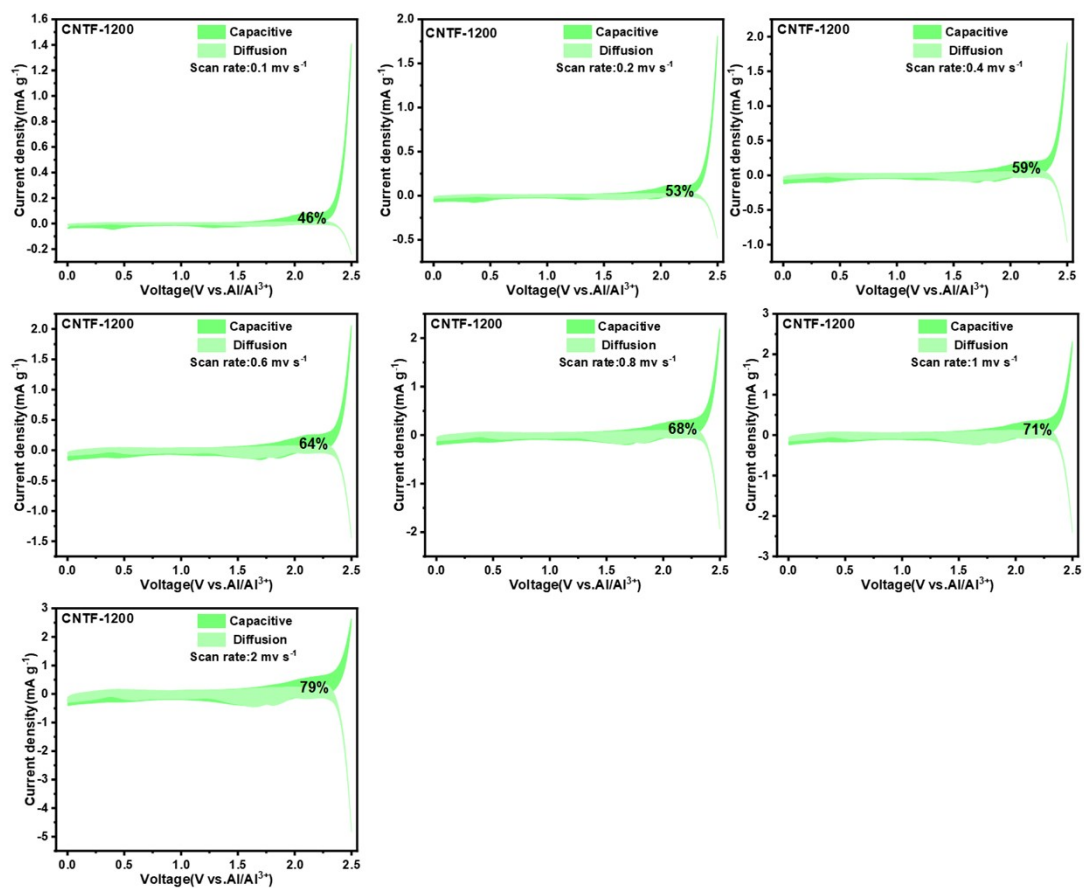


Fig.S4 The pseudocapacitance contribution of CNTF-1200 electrode at different scan rates in AIBs.

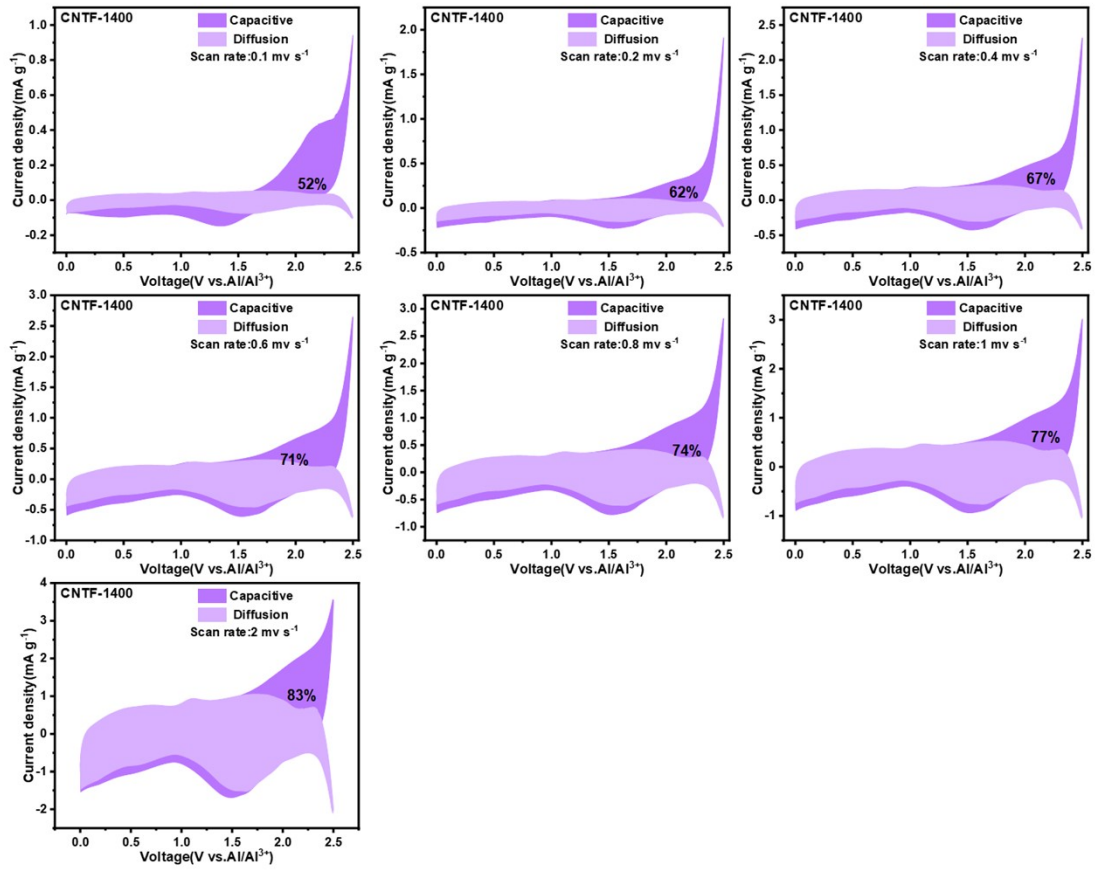


Fig.S5 The pseudocapacitance contribution of CNTF-1400 electrode at different scan rates in AIBs.

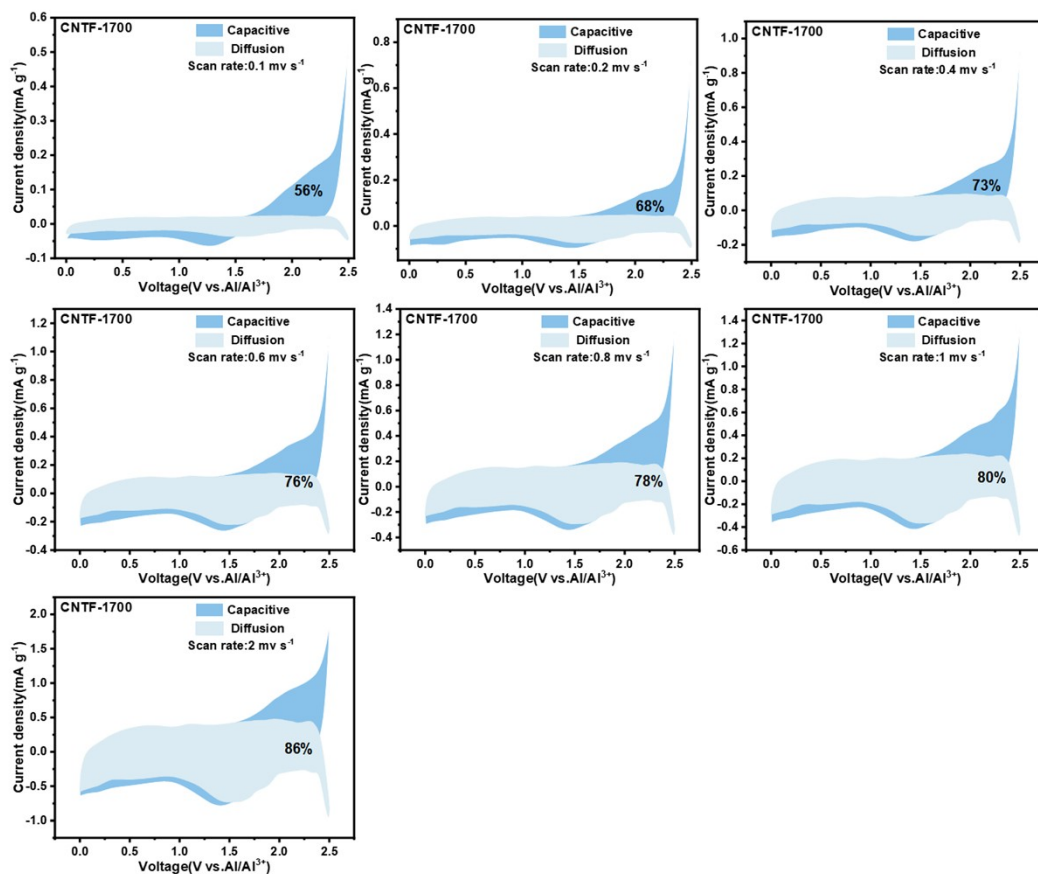


Fig.S6 The pseudocapacitance contribution of CNTF-1700 electrode at different scan rates in AIBs.

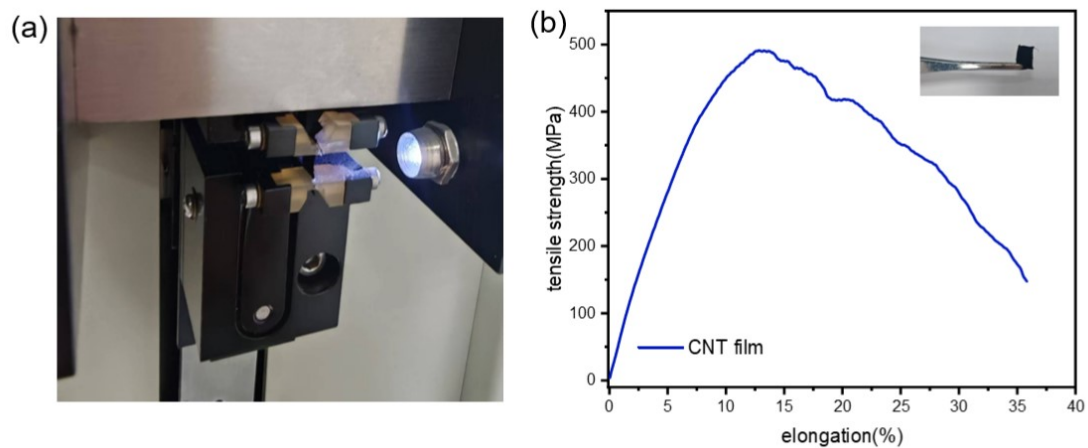


Fig.S7 (a) The carbon nanotube film is stretched using a drawing apparatus. (b) Tensile curve.



Fig.S8 The carbon nanotube film is folded into a boat.



Fig.S9 The carbon nanotube film is folded into an aircraft.

Table S1 Quantitative results of EDS mapping for elemental quantification

Element Weight/%	CNTF	CNTF-1000	CNTF-1200	CNTF -1400	CNTF-1700
C	84.61	90.60	91.21	97.82	96.03
O	4.08	2.28	2.50	1.82	3.80
Fe	11.31	7.12	6.29	0.36	0.18

Table S2 Relative content of C and O elements in CNTF, CNTF-1000, CNTF-1200, CNTF-1400 and CNTF-1700 samples in XPS test

Element Weight/%	CNTF	CNTF-1000	CNTF-1200	CNTF -1400	CNTF-1700
C	96.01	97.62	98.52	99.05	99.38
O	3.99	2.38	1.48	0.95	0.62
Total volume	100	100	100	100	100

Table S3 The C 1s peak fitting curve of all samples is about the ratio of sp² / sp³

	CNTF	CNTF-1000	CNTF-1200	CNTF-1400	CNTF-1700
sp ² (Area)	98910	104866	99418	111800	124630
sp ³ (Area)	77055	77884	64932	65750	53235
sp ² /sp ³ ratio	1.28	1.35	1.53	1.70	2.34

Table S4 The change of C-O peak position and full width at half maximum (FWHM) in O1s XPS spectra.

	CNTF	CNTF-1000	CNTF-1200	CNTF-1400	CNTF-1700
Peak Position(eV)	533.55	533.45	533.74	533.74	533.32
FWHM (eV)	2.03	2.19	2.96	3.01	2.67