Electronic Supplementary Material (ESI) for Nanoscale.

Supporting Information

MoO_3 nanosheet arrays as superior anode materials for Li- and Na-ion batteries

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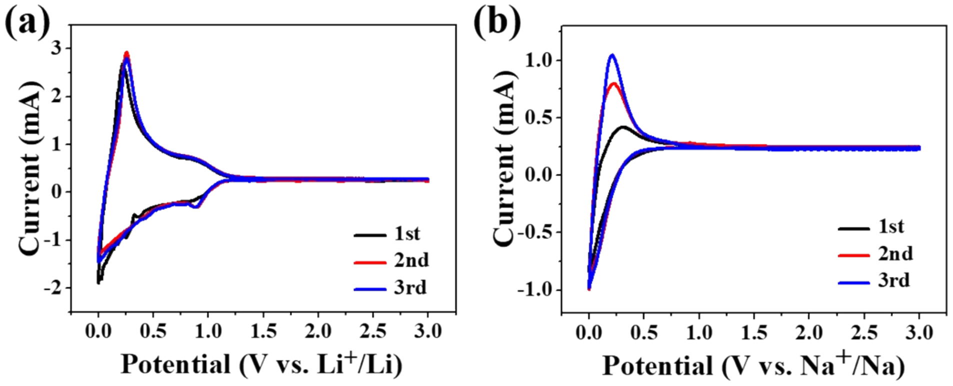

Fig. S1 The initial three CV curves of annealed CFC for (a) LIBs and (b) SIBs.

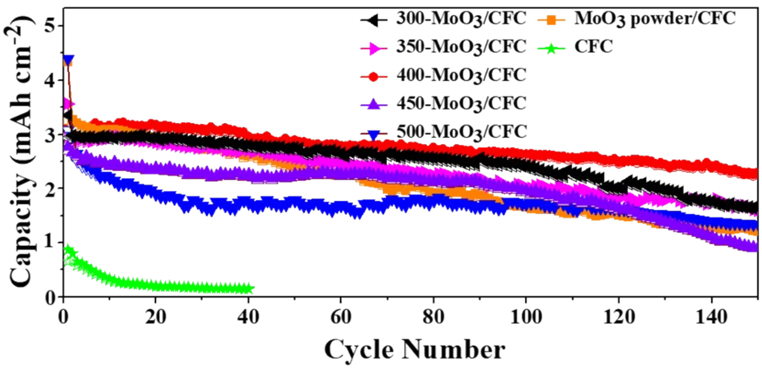

Fig. S2 Cyclic stabilities of MoO_3/CFC prepared under different annealing temperatures, MoO_3 power/CFC and annealed CFC for LIBs at a current density of 1 mA cm^{-2}.

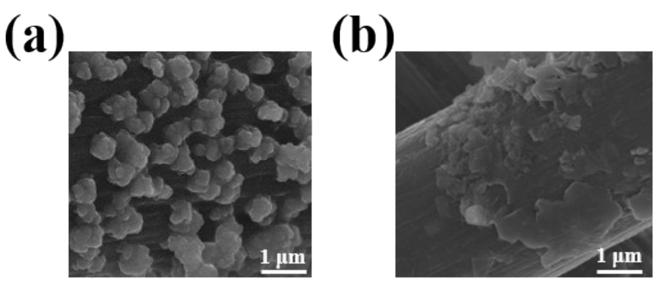

Fig. S3 The SEM images for LIBs: (a) MoO_3 NSA/CFC and (b) MoO_3 powder/CFC after cycling 20 times at a current density of 1 mA cm^{-2}.

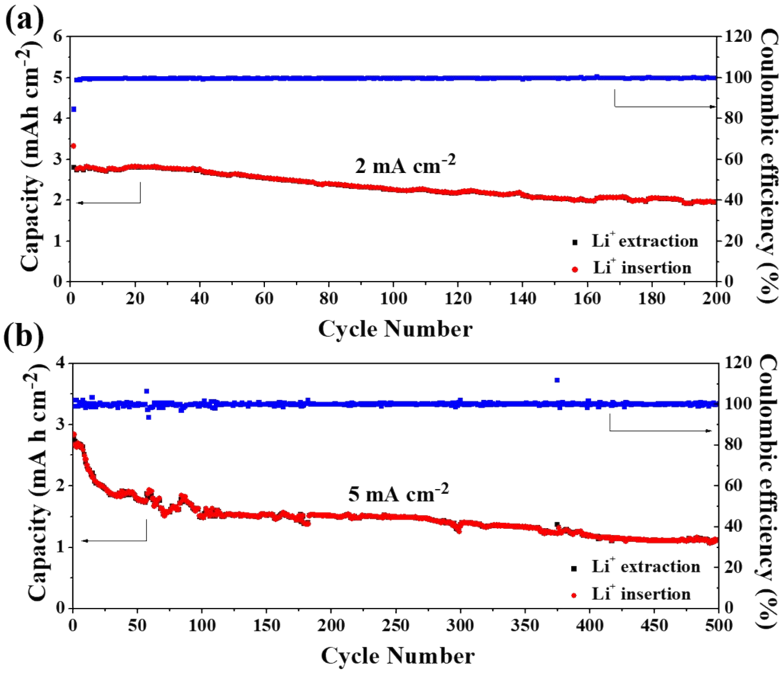

Fig. S4 LIBs: Cyclic stabilities of MoO_3 NSA/CFC at a current density of (a) 2 mA cm^{-2} and (b) 5 mA cm^{-2}.

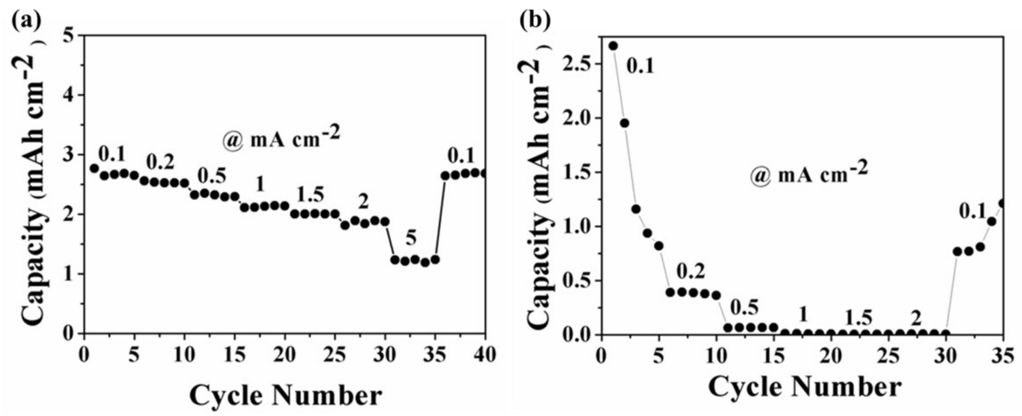

Fig. S5 Rate capability of annealed CFC without loading MoO_3 for (a) LIBs and (b) SIBs.

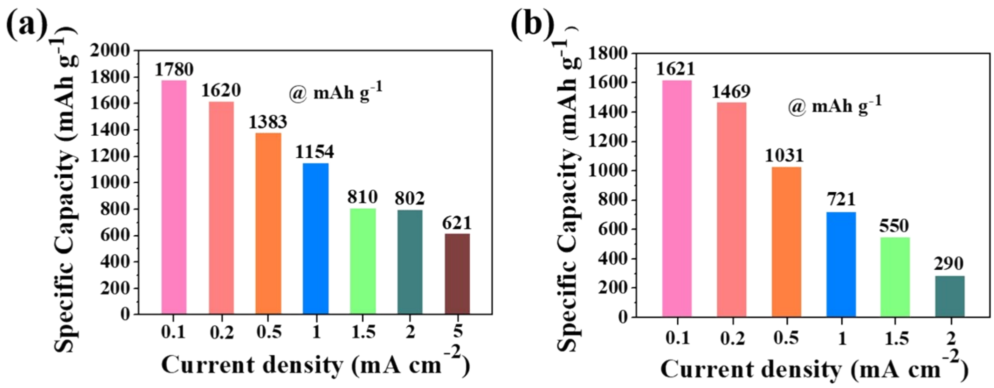

Fig. S6 The calculated specific capacity of MoO_3 NSA/CFC for (a) LIBs and (b) SIBs.

Calculations: The capacity of MoO_3/CFC is calculated by removing the contribution of pure CFC. Specifically, we calculate the specific capacity of MoO_3 NSA/CFC by using

$$SC_M = (AC_M - AC_C)/A_M$$

where SC_M is the specific capacity of MoO_3 NSA/CFC, AC_M and AC_C are the average area capacity of MoO_3 NSA/CFC and CFC, respectively, A_M is the mass loading of MoO_3 NSA/CFC. For example，the mass loading of MoO_3 NSA/CFC is 1.00 mg cm^{-2}, and the average area capacity of MoO_3 NSA/CFC is 4.48 mAh cm^{-2} at 0.1 mA cm^{-2} (Figure 4c). The average area capacity of CFC is 2.70 mAh cm^{-2} at 0.1 mA cm^{-2} (Figure S5). So, the average specific capacity of MoO_3 NSA/CFC at 0.1 mA cm^{-2} for LIBs is calculated as 1780 mAh g^{-1}.

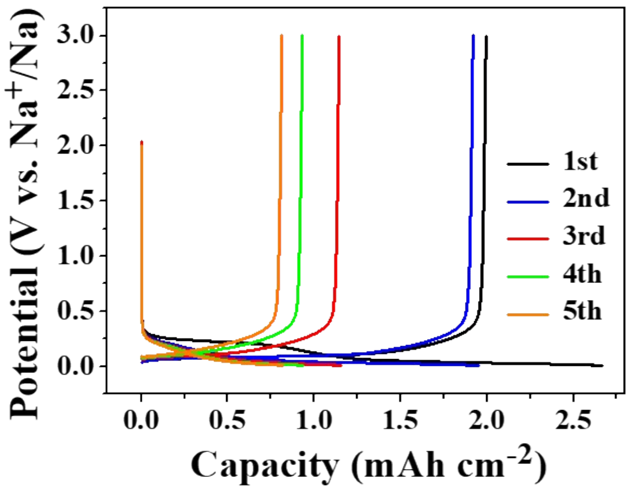

Fig. S7 Initial five discharge-charge curves of annealed CFC at 0.1 mA cm^{-2} for SIBs.

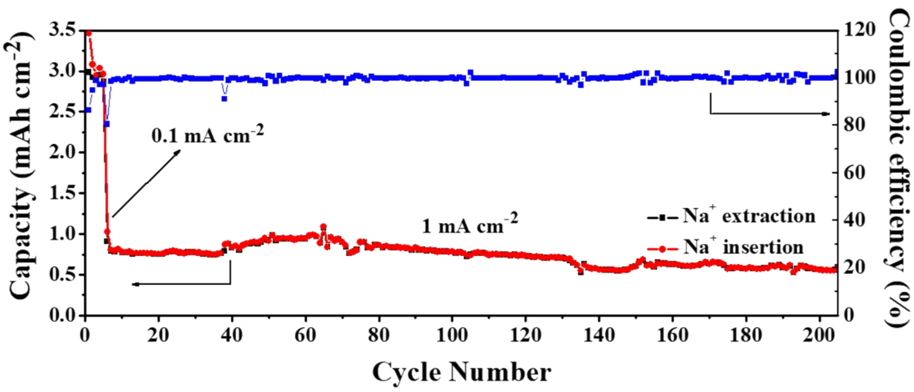

Fig. S8 SIBs: cyclic stabilities of MoO_3 NSA/CFC at a current density of 1 mA cm^{-2}.

Table S1. Comparison of MoO_3 based anode materials for LIBs

Active material	Current density	Discharge capacity	Charge capacity	Initial CE(%)	Reference
MoO_3 NSA/CFC	0.1 mA cm^{-2}	2273 mAh g^{-1}	1978 mAh g^{-1}	87	This work
graphite@MoO_3	60 mA g^{-1}	385 mAh g^{-1}			1
C–MoO_3 nanobelts	0.1C	~1300 mAh g^{-1}	~1118 mAh g^{-1}	~86	2
MoO_3/C	0.2C	945 mAh g^{-1}	813 mAh g^{-1}	86	3
α-MoO_3 film	50 mA g^{-1}	961 mAh g^{-1}	1662 mAh g^{-1}	58	4
MoO_3 film/Ni foam	70 mA g^{-1}	1286 mAh g^{-1}			5
α-MoO_3/graphene	50 mA g^{-1}	1406.8 mAh g^{-1}	977.7 mAh g^{-1}	70	6
MoO_3 film/Ti foil	0.13C	980 mAh g^{-1}			7
MoO_3/MWCNT	100 mA g^{-1}	1685.4 mAh g^{-1}	1028.3 mAh g^{-1}	61	8
MoO_3/C nanobelts	100 mA g^{-1}	1595 mAh g^{-1}	1014 mAh g^{-1}	64	9
MoO_3 nanoflower	550 mA g^{-1}	1432.5 mAh g^{-1}	1019.6 mAh g^{-1}	72	10
MoO_3/NC nanosheets	0.3C	1610 mAh g^{-1}	1359 mAh g^{-1}	84	11

HfO_2-coated MoO_3	100 mA g^{-1}	1728 mAh g^{-1}	1120 mAh g^{-1}	65	12
h-MoO_3 nanorods	150 mA g^{-1}	1418.3 mAh g^{-1}	924.2 mAh g^{-1}	65	13
C-MoO_3 NRs	0.1C	897 mAh g^{-1}			14
Mo-MoO_3-graphene	0.1C	1145 mAh g^{-1}	754 mAh g^{-1}	65	15
MoO_3/CNFs	500 mA g^{-1}	1102 mAh g^{-1}	716 mAh g^{-1}	65	16
MoO_3/graphene	50 mA g^{-1}	1548 mAh g^{-1}			17

Table S2. Comparison of MoO_3 based anode materials for SIBs

Active material	Current density	Discharge capacity	Charge capacity	Initial CE(%)	Reference
MoO_3 NSA/CFC	0.1 mA cm^{-2}	1897 mAh g^{-1}	1365.8 mAh g^{-1}	72	This work
α-MoO_3	0.1C	771 mAh g^{-1}	410 mAh g^{-1}	53	18
α-MoO_3 nanobelts	100 mA g^{-1}	545 mAh g^{-1}	330 mAh g^{-1}	61	19
MoO_3/rGO	0.2C	1061.2 mAh g^{-1}	934.4 mAh g^{-1}	88	20
MoO_3/graphene	50 mA g^{-1}	365.4 mAh/g			21
α-MoO_3 microrods	100 mA g^{-1}	836 mAh g^{-1}	344.5 mAh g^{-1}	41	22

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