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

Supporting Information

Few-layer MoS_2 anchored at nitrogen-doped carbon ribbons for sodium-ion battery anode with high rate performance

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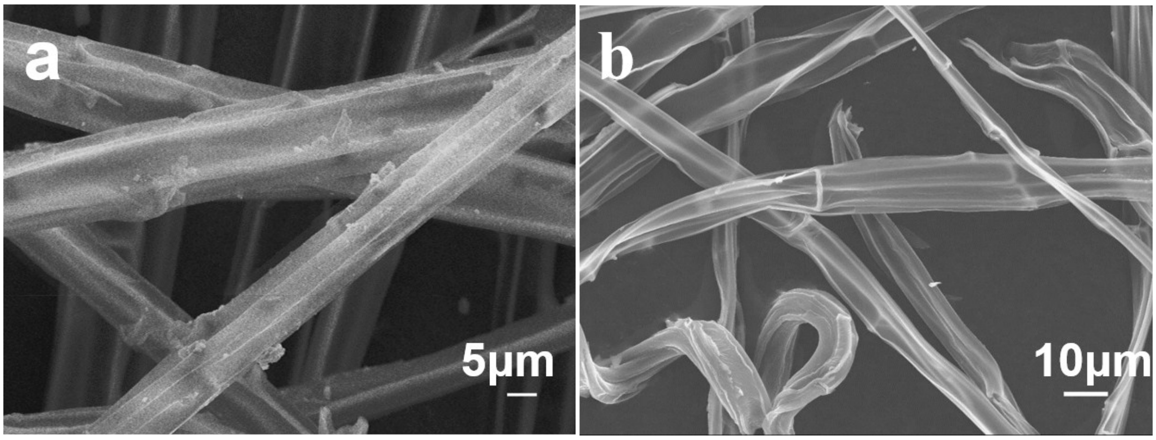

Figure S1. SEM images of wild raupos (a), and AMCRs (b).

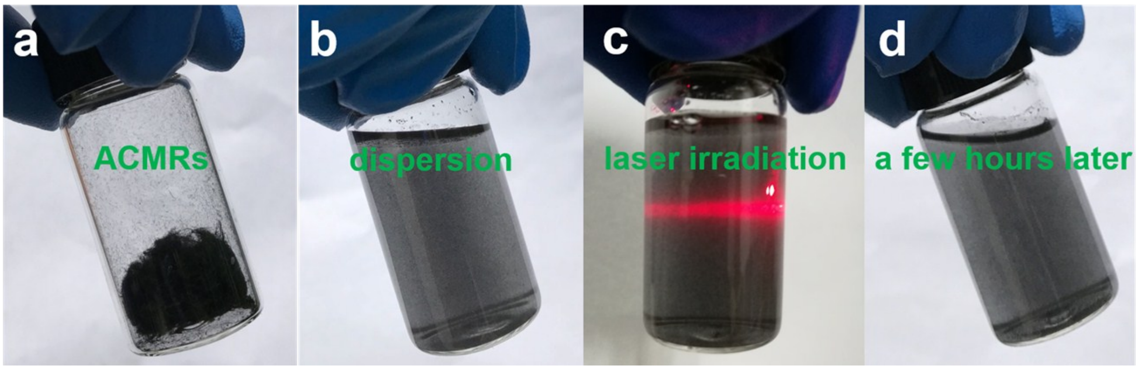

Figure S2. The excellent dispersion of AMCRs in distilled water. Moderate AMCRs in a vial (a), the AMCRs dispersing in equivalent amount of water relative with synthetic procedure (b), and Tyndall effect under laser irradiation (c), the dispersion retention of AMCRs in water after a few hours.

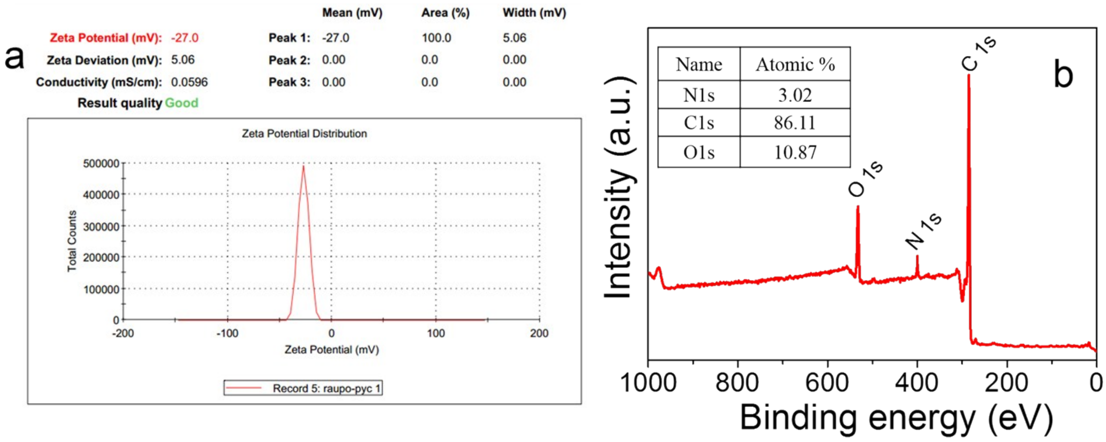

Figure S3. Zeta potential pattern of AMCRs (a), XPS survey spectrum of AMCRs (b).

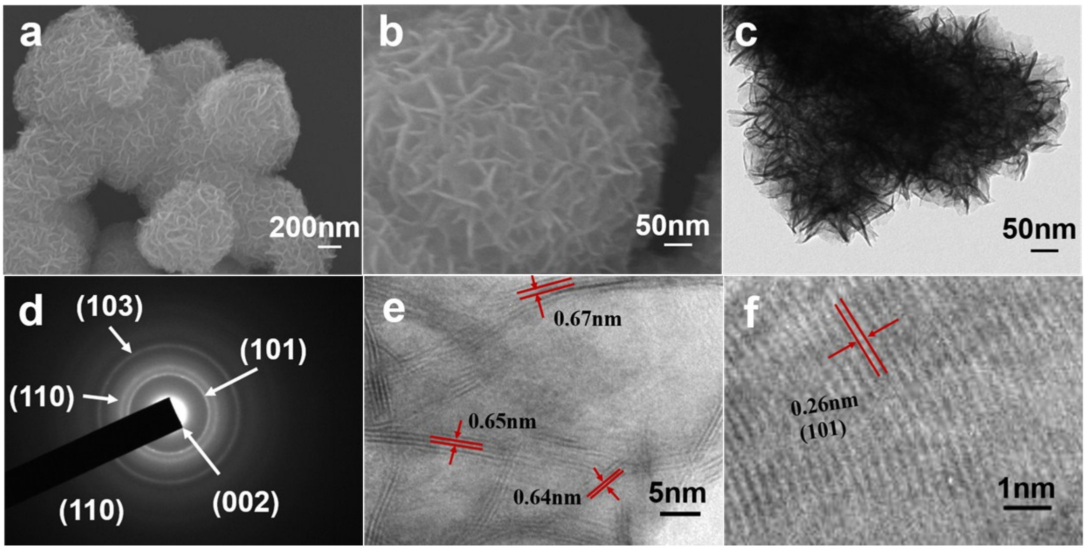

Figure S4. Electron microscopic characterization of MoS_2 aggregations. SEM morphologys (a, b) in different magnifications, TEM image (c), SAED pattern (d), and HRTEM images (e, f).

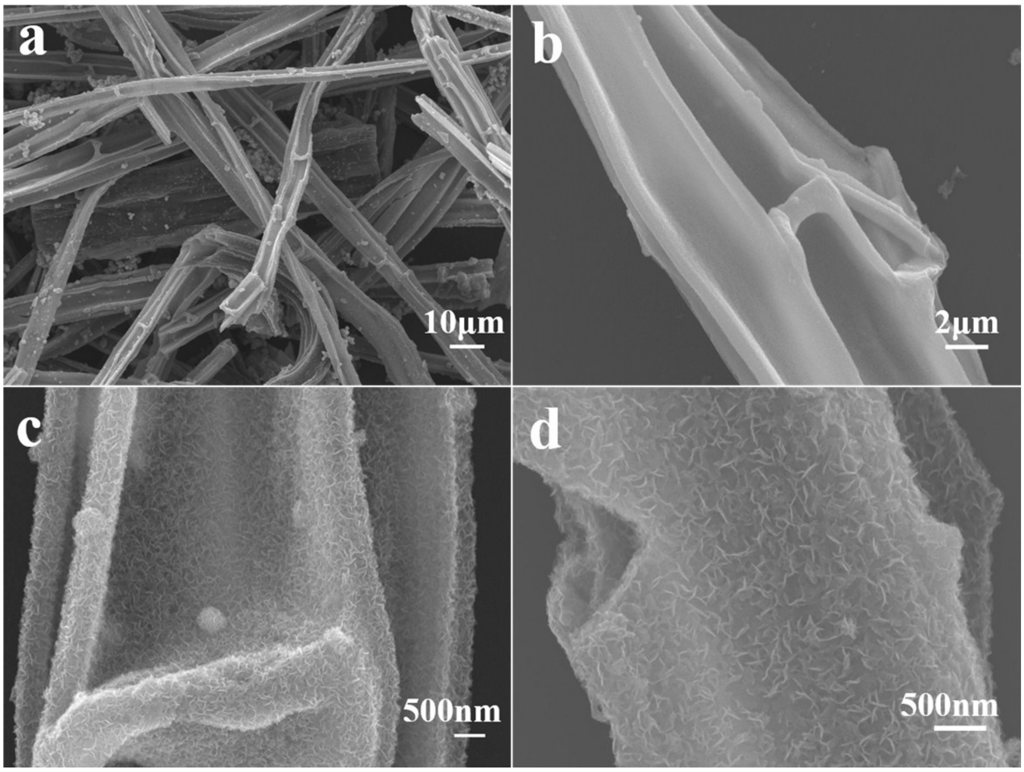

Figure S5. SEM images of MoS_2@AMCRs at different scales (a, b, c, d).

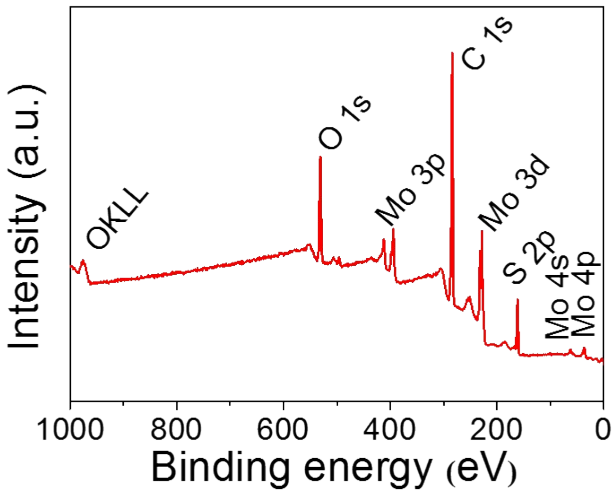

Figure S6. XPS survey spectrum of MoS_2@AMCRs composite.

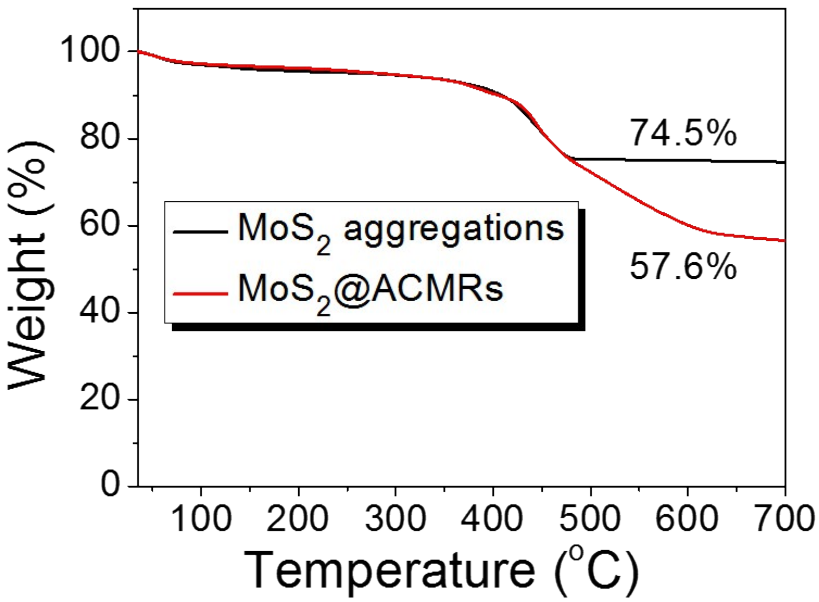

Figure S7. Thermogravimetric analysis of self-assembly MoS_2 and MoS_2@AMCRs. Let the weight percentage of MoS_2 in the MoS_2@AMCRs to be x. Assuming AMCRs are completely removed after combustion, one has 0.745x = 0.576. Therefore x = 0.773.

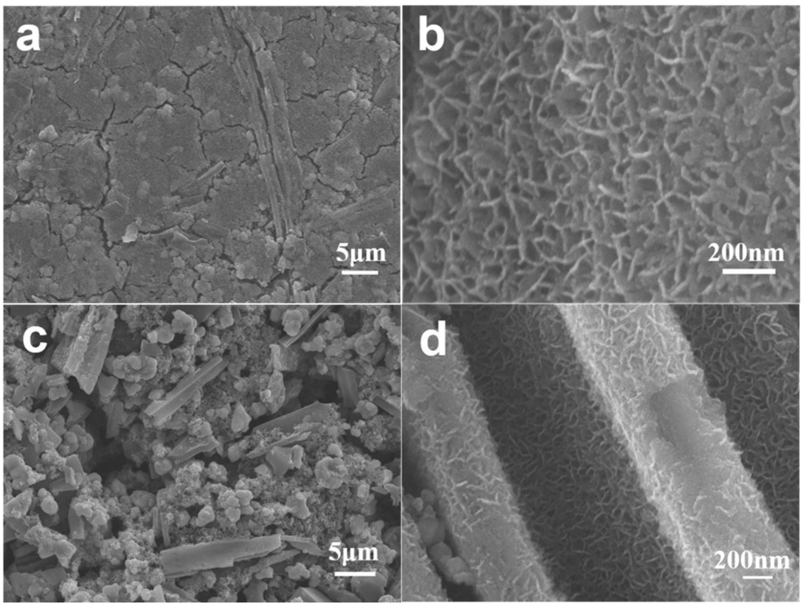

Figure S8. Postmortern morphologys of anodes after 10 charge-discharge cycles: CMC as the binder (a, b), and PVDF as the binder (c, d) in different magnifications.

Table S1. Literature analysis of battery performance including capacity, cycling stability, and rate capability.

Mophology	Cycle performance				Rate performance	Ref.
	Initial discharge capacity [mA h g^{-1}]	Cycle number	Final capacity [mA h g^{-1}]	Current density [A g^{-1}]		
MoS_2@AMCRs	582	300	305	1	495mA h g^{-1}@0.05 A g^{-1}; 456@0.1; 425@0.2; 381@0.5; 366@1; 302@2.	This work
Ultrathin MoS_2	800	100	251	0.32	500mA h g^{-1}@0.04 A g^{-1}; 410@0.08; 400@0.16; 220@0.32.	36a
MoS_2/Graphene	600	100	380	0.02	520mA h g^{-1}@0.02 A g^{-1}; 500@0.04; 450@0.08; 400@0.16; 350@0.32.	36b
MoS_2@Graphene paper	338	20	218	0.025	240 mA h g^{-1}@0.025 A g^{-1}; 223@0.05; 214@0.1; 160@0.2.	36c
wormlike MoS_2	670	80	410.5	0.06	450 mA h g^{-1}@0.06 A g^{-1}; 380@0.1; 160@0.25; 80@0.6.	36d
MoS_2@PEO	242	70	119	0.05	185 mA h g^{-1}@0.05 A g^{-1}; 162@0.1; 143@0.25; 127@0.5; 112@1.	36e
TiO_2@MoS_2@Carbon cloth	460	200	157	0.5	650 mA h g^{-1}@0.1 A g^{-1}; 550@0.2; 450@0.4; 380@0.8.	36f
MoS_2@PAN	300	100	130	0.3	350 mA h g^{-1}@0.02 A g^{-1}; 200@0.1; 150@0.3; 100@1.	36g
MoS_2@Graphene paper	470	300	76.8	0.1	264 mA h g^{-1}@0.1 A g^{-1}; 200@0.2; 180@0.4; 150@1.6; 80@3.2.	36h
MoS2@Nitrogen-doped carbon	810	150	340	0.15	510 mAh g^{-1}@ 0.150 A g^{-1}, 400@ 0.3, 310@0.6, 240@1.5, 180@3A g^{-1}	36i