Electronic Supplementary Material (ESI) for Nanoscale.

Supporting Information

MoS_2/CoS heterostructures grown on carbon cloth as free-standing anodes for high-performance sodium-ion batteries

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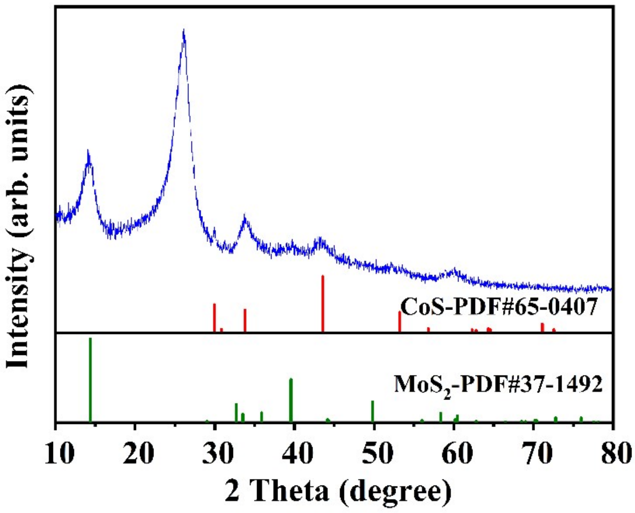

Fig. S1 The XRD pattern of MoS_2/CoS@CC intermediate.

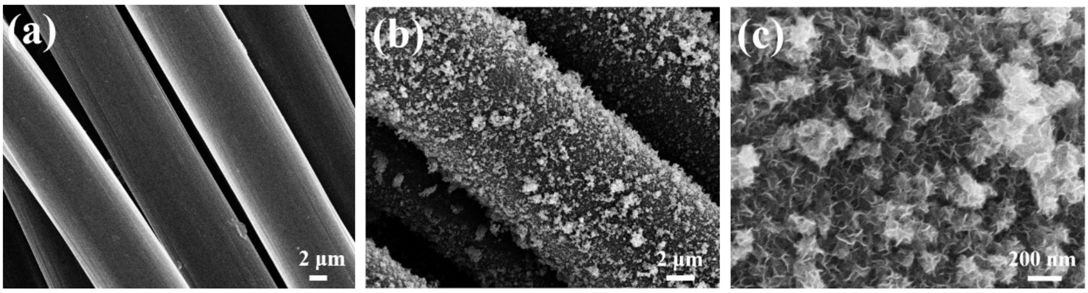

Fig. S2 SEM images of bare CC (a) and MoS_2/CoS intermediate arrays on CC (b, c), respectively.

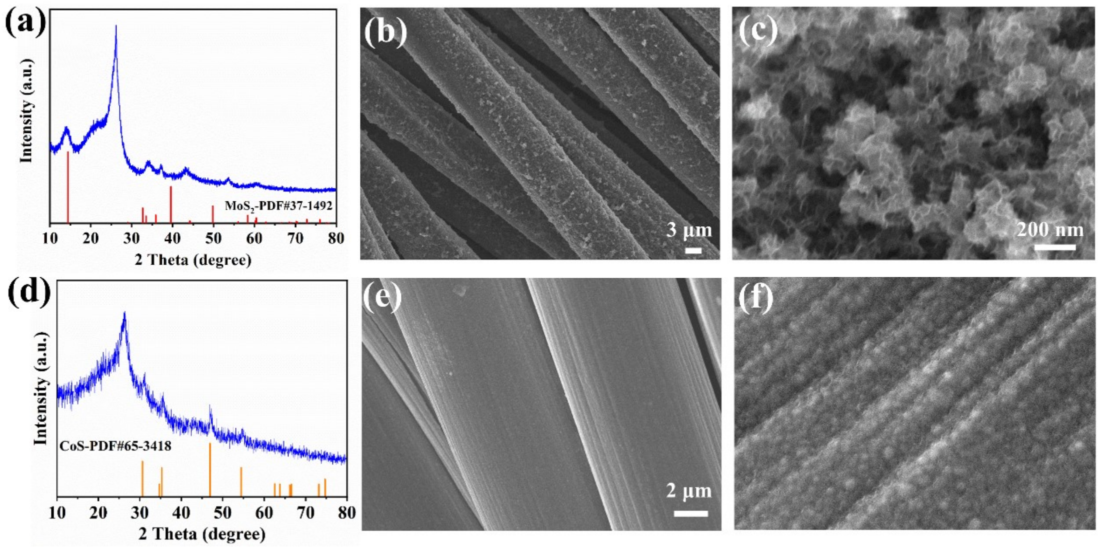

Fig. S3 (a) XRD pattern, and (b,c) SEM images of MoS_2@CC; (d) XRD pattern, and (e,f) SEM images of CoS@CC.

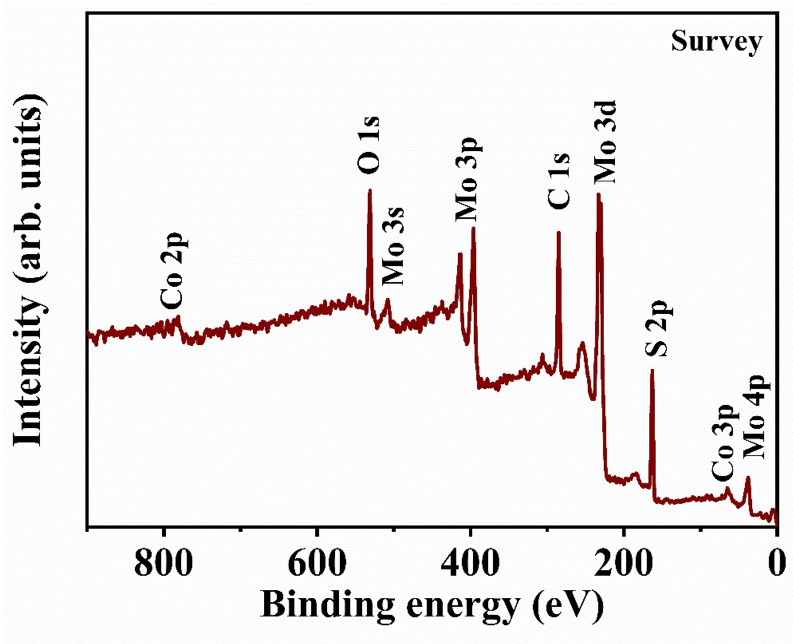

Fig.S4 XPS survey spectrum of MoS_2/CoS@CC.

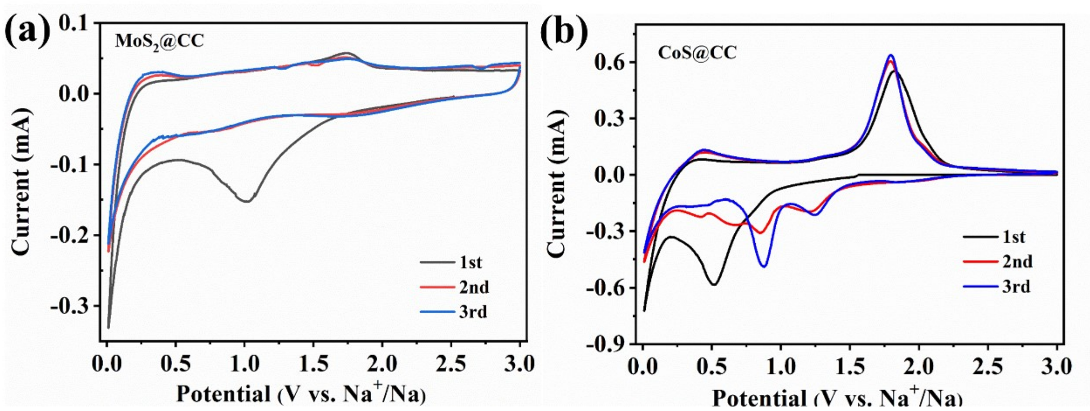

Fig.S5 CV curves of MoS_2@CC (a) and CoS@CC (b) at a scan rate of 0.1 mV s^{-1}.

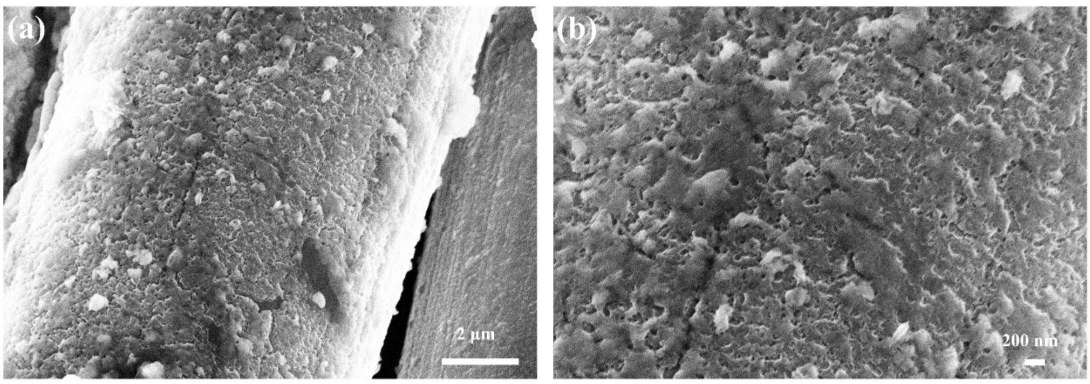

Fig.S6 SEM images of MoS_2/CoS@CC electrodes after 100 cycles at a current density of 0.5 A g^{-1}.

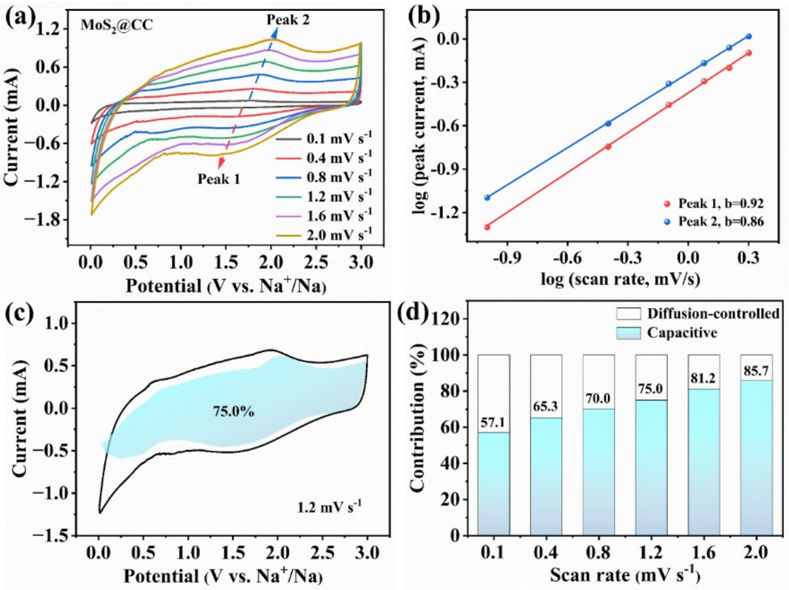

Fig.S7 (a) CV curves of plain MoS_2@CC electrode at different scan rates. (b) The corresponding relationship between log(i) vs. log(v) at each redox peak current. (c) CV curve of the capacitive-controlled capacity at 1.2 mV s^{-1}, denoted by theshaded area. (d) The capacitive- and diffusion-controlled behavior contribution ratios at different scan rates.

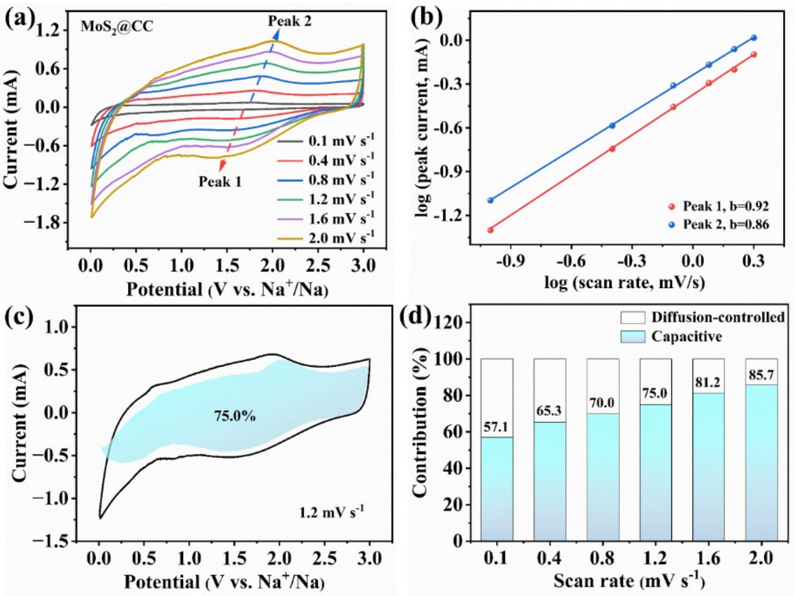

Fig.S8 (a) CV curves of plain CoS@CC electrode at different scan rates. (b) The corresponding relationship between log(i) vs. log(v) at each redox peak current. (c) CV curve of the capacitive-controlled capacity at 1.2 mV s^{-1}, denoted by theshaded area. (d) The capacitive- and diffusion-controlled behavior contribution ratios at different scan rates.

Table S1 Electrochemical performances of reported MoS_2-based anode for SIBs.

Materials	Cyclability ($mAh\ g^{-1}$)	Rate capability ($mAh\ g^{-1}$)	Ref
1T MoS_2 nanosheets	410 at 0.1 A g^{-1} after 150 cycles	253 at 2.0 A g^{-1}	[1]
MoS_2–CNF	525 at 0.05 A g^{-1} after 70 cycles	186 at 2.0 A g^{-1}	[2]
HMF-MoS_2	384 at 0.1 A g^{-1} after 100 cycles	226 at 5.0 A g^{-1}	[3]
NiS/MoS_2/C	516 at 0.1 A g^{-1} after 60 cycles	398 at 5.0 A g^{-1}	[4]
MoS_2-graphene	313 at 0.05 A g^{-1} after 200 cycles	175 at 2.0 A g^{-1}	[5]
MoS_2/CoS_2	396.6 at 0.1 A g^{-1} after 80 cycles	389 at 0.5 A g^{-1}	[6]
MoS_2@CF	100 at 0.1 A g^{-1} after 100 cycles	171 at 5.0 A g^{-1}	[7]
Cu_2S@carbon@MoS_2	365 at 0.3 A g^{-1} after 100 cycles	297 at 3.0 A g^{-1}	[8]
MoS_2/CoS@CC	**605 at 0.5 A g^{-1} after 100 cycles**	**366 at 8.0 A g^{-1}**	**This work**

Table S2 Fitting results of Nyquist plots based on the equivalent circuit in Fig. 5e.

Electrodes	R_{ct}	R_s	**σ ($\Omega\ cm^2\ s^{-1/2}$)**
MoS_2/CoS@CC	155.2	6.0	548.0
MoS_2@CC	466.9	7.0	1363.3
CoS@CC	204.1	3,2	824.6

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