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Supporting Information for

Interlayer expansion of few-layered Mo-doped SnS_2 nanosheets grown on carbon cloth with excellent lithium storage performance for lithium ion batteries

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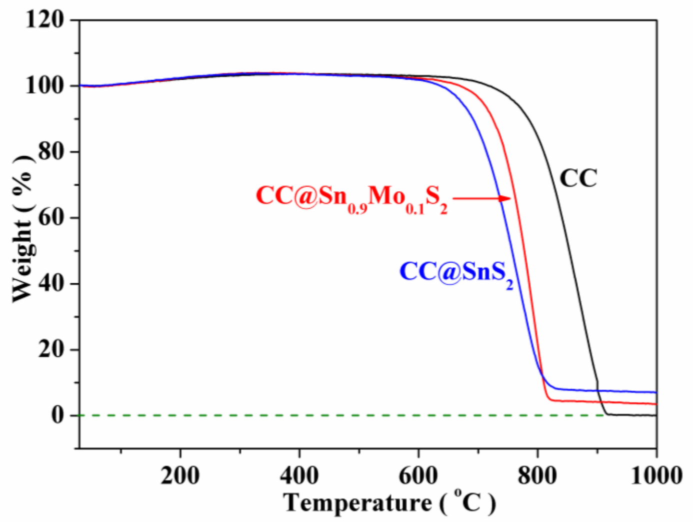

Fig. S1 TGA curves of CC, $CC@SnS_2$ and $CC@Sn_{0.9}Mo_{0.1}S_2$.

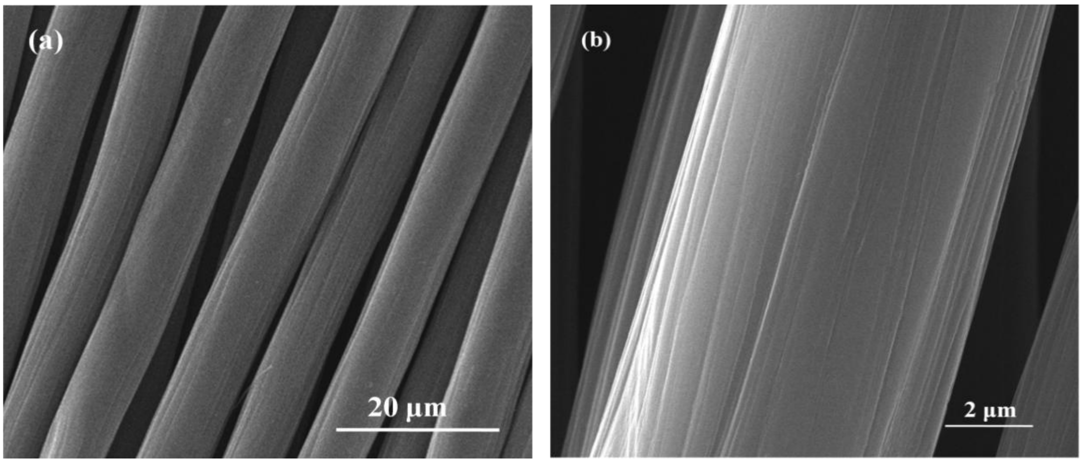

Fig. S2 SEM images of carbon cloth.

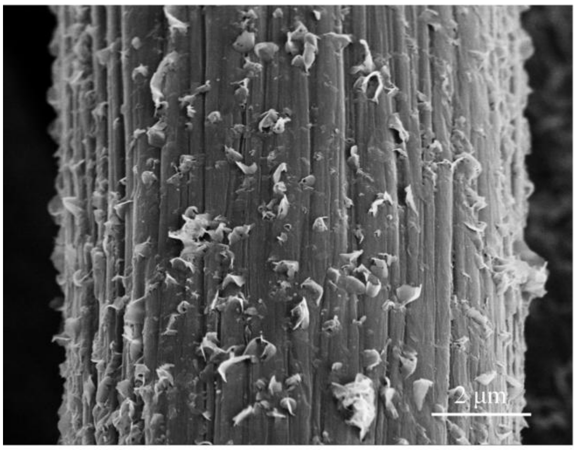

Fig. S3 SEM image of SnS_2 prepared at 200 ℃ 20 hours.

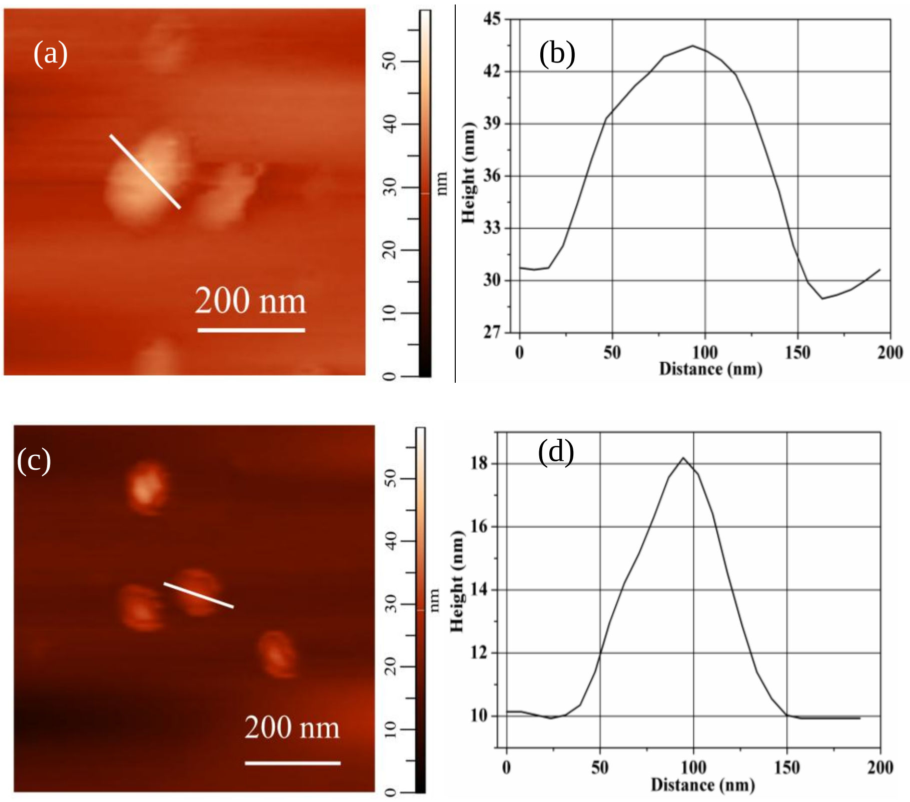

Fig. S4 Typical AFM images (a, c) and thickness profiles (b, d) of SnS_2 (a, b) and $Sn_{0.9}Mo_{0.1}S_2$ nanosheets after transferred onto mica substrates. The thickness of SnS_2 nanosheets is about 14 nm, and that of $Sn_{0.9}Mo_{0.1}S_2$ nanosheets is about 8 nm.

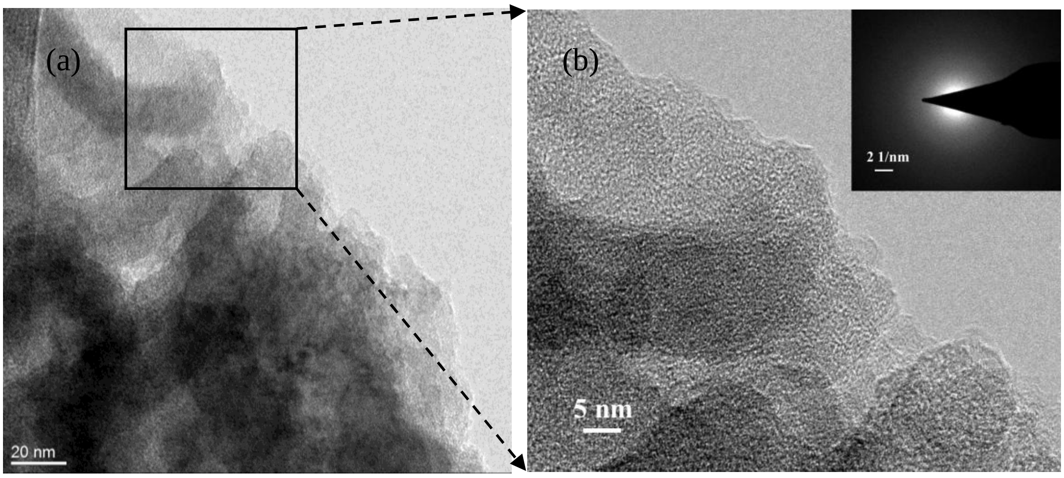

Fig. S5 *Ex-situ* TEM (a) and HRTEM images of CC@$Sn_{0.9}Mo_{0.1}SnS_2$ electrode after the first discharge at 1 A g^{-1}. Inset of b: showing the corresponding selected area electron diffraction (SAED) pattern.

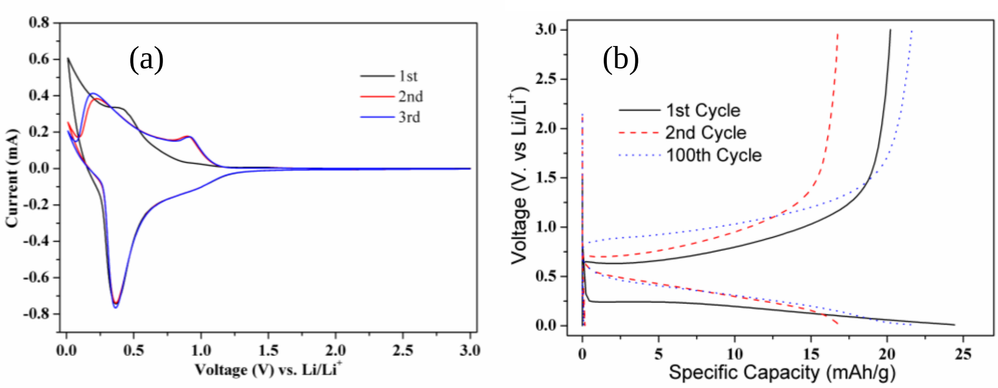

Fig. S6 (a) CV curves of CC measured between 0.01 and 3.0 V at a scan rate 0.1 mV s^{-1} at a scan and (b) charging/discharging voltage profiles of CC at a current density of 1 A g^{-1}.

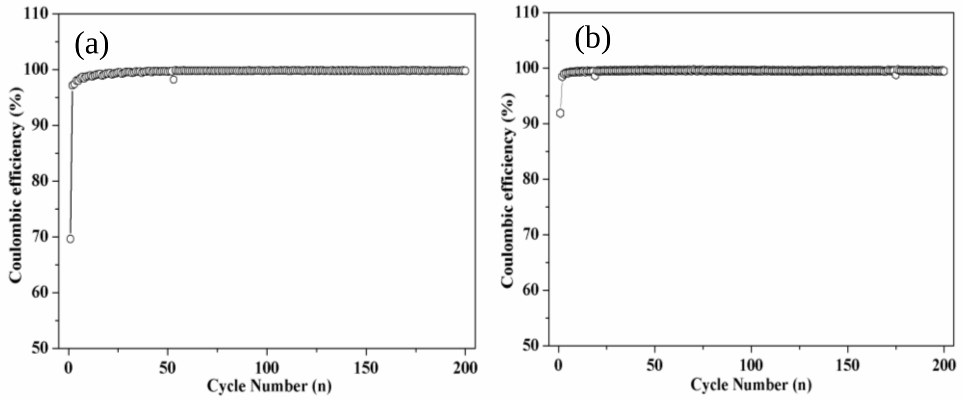

Fig. S7 Coulombic efficiency curves of CC@SnS_2 (a) and CC@$Sn_{0.9}Mo_{0.1}S_2$ (b) at a current density of 1 A g^{-1}.

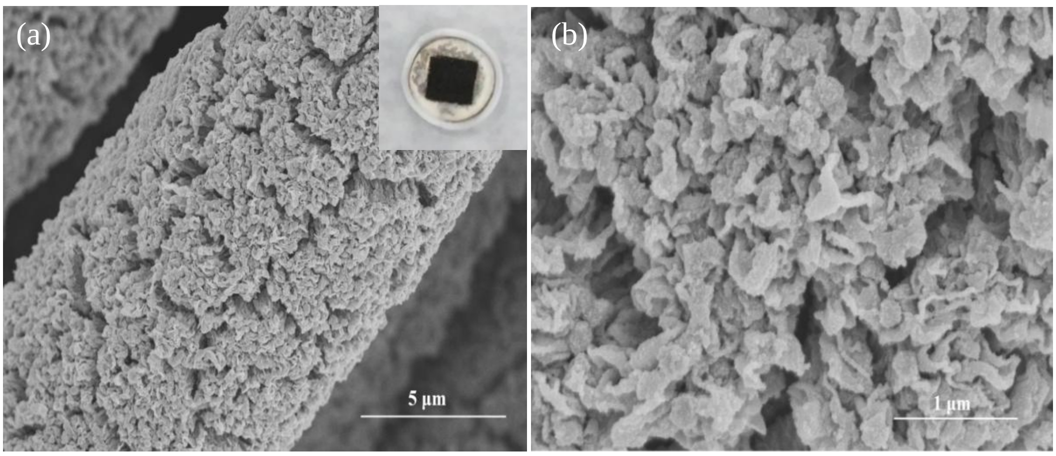

Fig. S8 (a) low and (b) high magnification SEM images of CC@$Sn_{0.9}Mo_{0.1}S_2$ electrode after 200 cycles at current density of 1 A g^{-1}. Inset of (a): Photogragh of CC@$Sn_{0.9}Mo_{0.1}S_2$ electrode after 200 cycles.

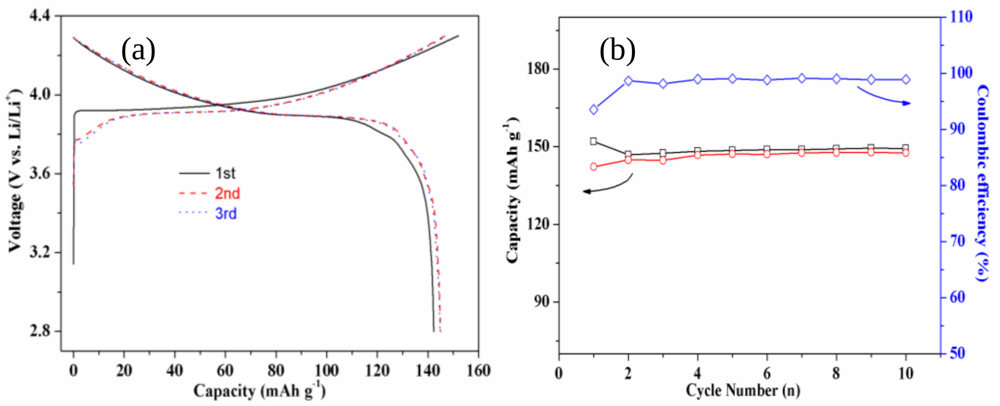

Fig. S9 Electrochemical performance of $LiCoO_2$ electrode: The 1st, 2nd and 3rd charge-discharge voltage curves (a) and Cycle performance (b) at a current density of 0.1 C.

Table S1 Electrochemical performance of various SnS_2-based anode materials for lithium-ion batteries.

Electrode materials	Current density (A g^{-1})	Initial discharge/charge capacity (mAh g^{-1}), Initial CE	Discharge capacity (mAh g^{-1})	Rate capacipy (mAh g^{-1})	Reference
CC@$Sn_{0.9}Mo_{0.1}S_2$ NS	1	2033.6/1869.8 91.9 %	1950.8 200 cycles	914.5 5 A g^{-1}	This work
CC@SnS_2 NS	1	1272.4/885.9 69.6 %	584.9 200 cycles	171.1 5 A g^{-1}	This work
Ce doped SnS_2 flowerlike	0.09	998.2/569.7, 57 %	450.7 50 cycles	321.9 0.9 A g^{-1}	1
SnS_2 nanobelts	0.065	1232.2/645.4 52.4 %	560 50 cycles	273 1.3 A g^{-1}	2
SnS_2 nanocrystals@RGO	0.065	1596/1257 78.7 %	1034 200 cycles	415 3.25 A g^{-1}	3
SnS_2@graphene nanocable	0.2	1334/764 58.3 %	720 350 cycles	580 1 A g^{-1}	4
SnS_2 NS@MWCNTs	0.1	1497.3/557 37.2	506 50 cycles	513.8 0.5 A g^{-1}	5
SnS_2@PANI nanoplates	0.1	1395.8/968.7 69.4 %	730.8 80cycles	356.1 5 A g^{-1}	6
3D-hierarchical SnS_2 structures	0.65	2283.6/795 34.8 %	570.3 100 cycles	486.2 3.25 A g^{-1}	7
CNT@SnS_2 tubular nanosheaths	0.1	1522/713 46.8 %	502 100 cycles	260 0.4 A g^{-1}	8
CC-VN@SnS_2	0.65	1098/763	791	349	9

nanocomposites		77 %	100 cycles	13 A g^{-1}	
2D graphene-SnS_2 nanoplate	0.05	1900[(a)]/687 36.2 %	650 30 cycles	230 6.4 A g^{-1}	10
MWCNTs)/SnS_2 NS	0.645	2978/778 26.1 %	432 100 cycles	420 6.45 A g^{-1}	11
SnS_2 nanocrystal–NGS	0.2	1178.5/1062.1 90.1 %	1407 120 cycles	520 5 A g^{-1}	12
SnS_2/VACNTs	0.1	1646/601 36.5 %	551 100 cycles	223 2 A g^{-1}	13
3D porous SnS_2 /carbon clothes	0.194	1380/977 70.8 %	878 60 cycles	223 3.23 A g^{-1}	14
3D SnS_2@GF	1	1361.9/948.4 69.6 %	818.4 500 cycles	160.9 5 A g^{-1}	15
3D hierarchical SnS_2 nanoflowers	0.1	1455.3/519 35.6 %	519 50 cycles	297 0.8 A g^{-1}	16
stackes SnS_2/graphene	0.2	1299/1160 89.3 %	1063 100 cycles	712 5 A g^{-1}	17
3D SnS_2 nanoplates /graphene	0.1	1677/1195 71.3 %	1060 200 cycles	670 2 A g^{-1}	18
2D SnS_2 nanoplates	0.2	1416/1028 72.6 %	935 30 cycles	523 3 A g^{-1}	19
CC@TiO_xN_y@SnS_2	0.645	1082/800 74 %	612 100 cycles	419 3.25 A g^{-1}	20
SnS_2 NS-graphene	0.066	1505/1077.6 71.6 %	896 40 cycles	934 0.66 A g^{-1}	21
SnS_2 nanoplates	0.1	1438/590 41 %	521 50 cycles	340 3 A g^{-1}	22
C-SnS_2	0.05	1724.4/707 41 %	668 50 cycles	650 0.5 A g^{-1}	23
3D SnS_2/graphene aerogels	0.05	4030/1485 37 %	656 30 cycles	240 1 A g^{-1}	24
RGO–SnS_2	0.065	1278.4/811 63.44 %	733 10 cycles	200 3.25 A g^{-1}	25
few-layer SnS_2/graphene	0.1	1664/705 42.4 %	920 50 cycles	600 1 A g^{-1}	26
3D SnS_2 nanoflowers	0.4	2130/1140 53.5 %	455.5 100 cycles	495.5 1.6 A g^{-1}	27
SnS_2/Co_3O_4	0.1	1344/985 73 %	715 100 cycles	530 1 A g^{-1}	28
SnS_2/RGO	0.1	2190.5/1382.4 63.1 %	939.9 30 cycles	650.5 0.8 A g^{-1}	29
SnS_2/CNTs	0.1	1430.5/410 28.7 %	373.1 50 cycles	370 1 A g^{-1}	30

graphene-CNT/SnS_2	0.1	1774.3/1118.2 63 %	1017.5 100 cycles	634.6 2 A g^{-1}	31

CE respents Coulumbic efficiency, NS respents nanosheets. (a): Values are estimated from graph.

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