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Supporting Information

Ultrasmall MoS_2 Embedded in Carbon Nanosheets Coated Sn/SnO_x as Anode Material for High-Rate and Long Life Li-Ion Batteries

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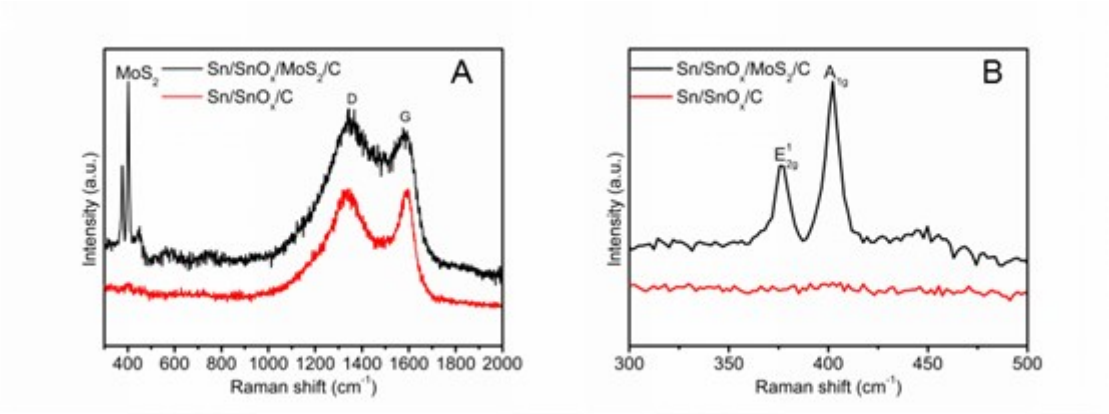

Fig. S1 (A) Raman spectrum of $Sn/SnO_x/MoS_2/C$ and $Sn/SnO_x/C$ composite. (B) Magnified Raman spectrum of $Sn/SnO_x/MoS_2/C$ and $Sn/SnO_x/C$ composite,exhibiting the typical MoS_2 characteristic signature.

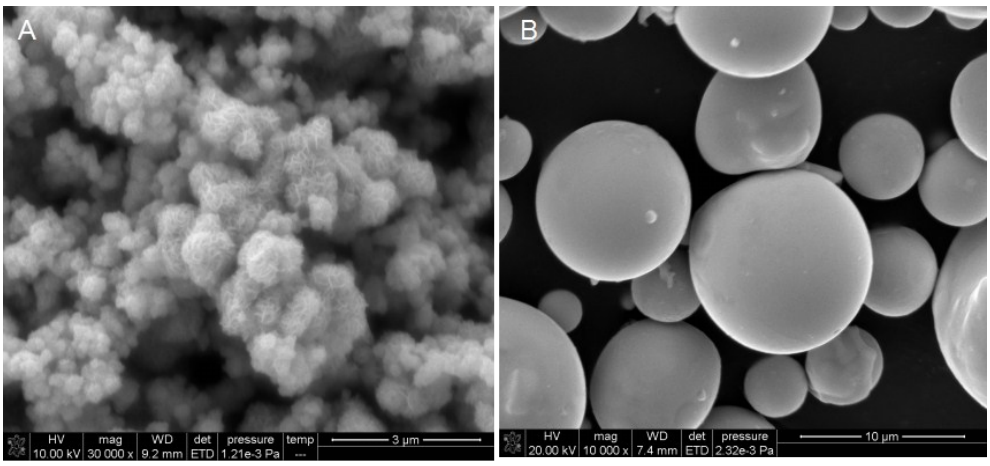

Fig. S2 (A) SEM images of MoS_2 and (B) pure Sn.

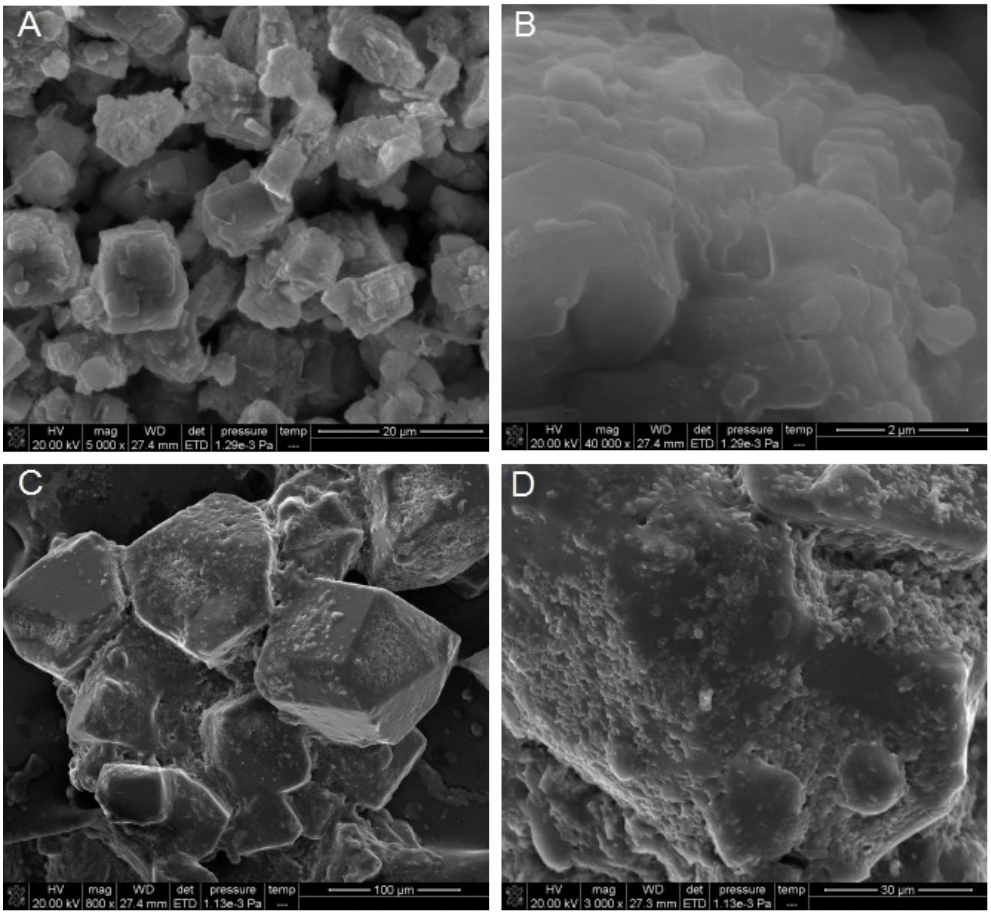

Fig. S3 (A,B) SEM images of $Sn/SnO_x/C$ composite containing NaCl. (B) $Sn/SnO_x/C$ composite without NaCl.

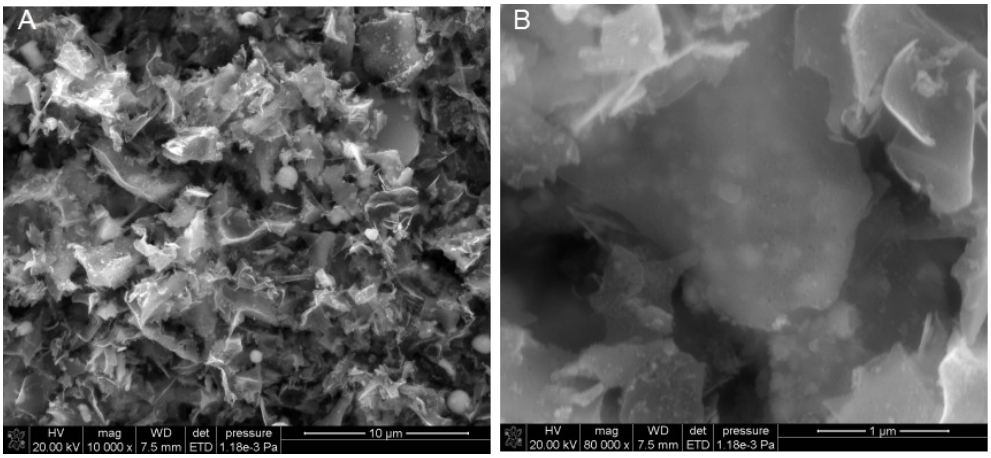

Fig. S4 SEM images of $Sn/SnO_x/C$ composite after remove NaCl.

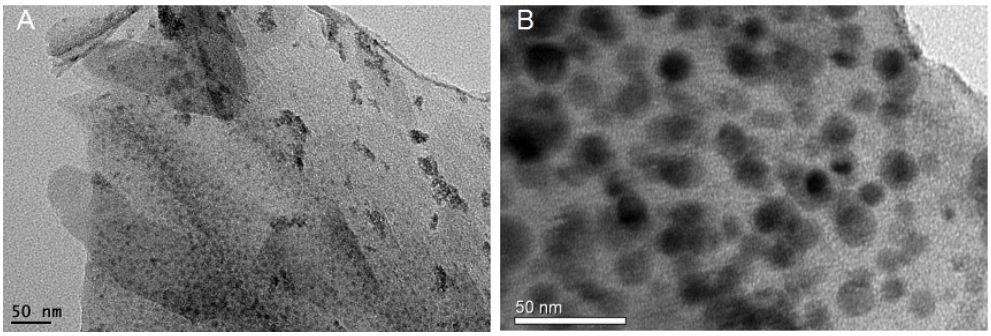

Fig. S5 (A)TEM images of $Sn/SnO_x/C$ composite with adding NaCl and (B) $Sn/SnO_x/C$ composite without adding NaCl.

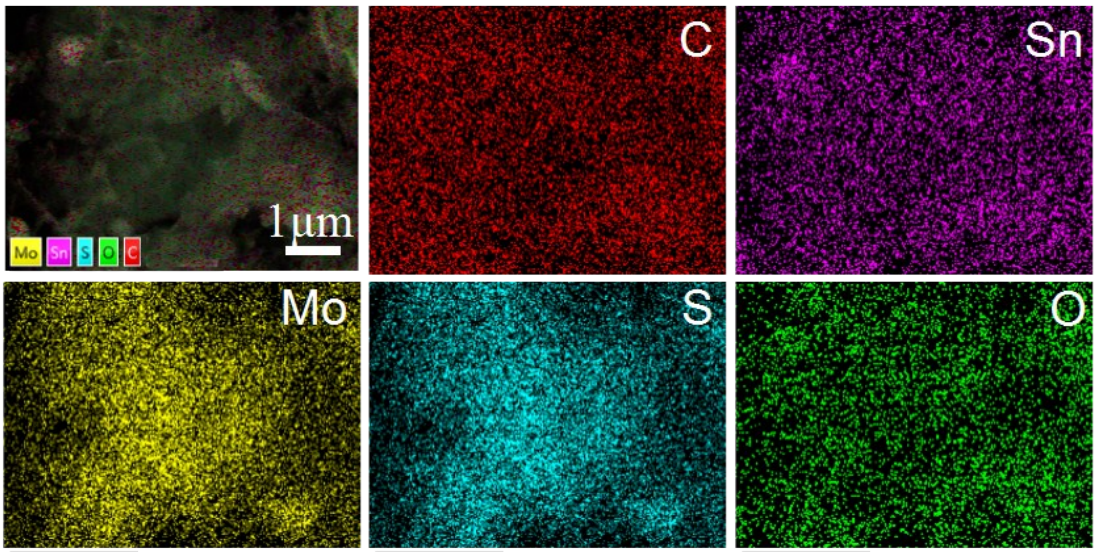

Fig. S6 SEM and EDS mapping images of $Sn/SnO_x/MoS_2/C$ composite.

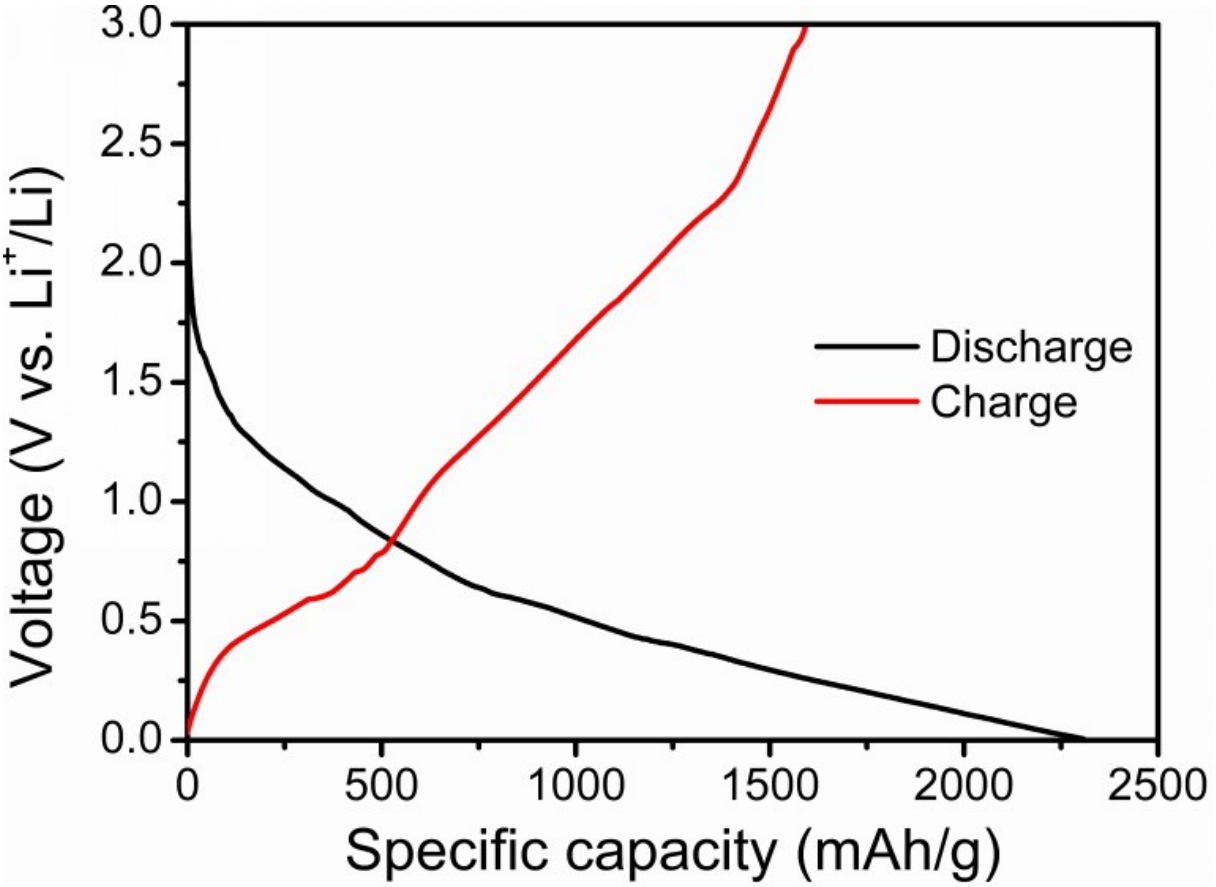

Fig. S7 The first charge and discharge profile of the prepared Sn/SnOx/MoS_2/C-II composite.

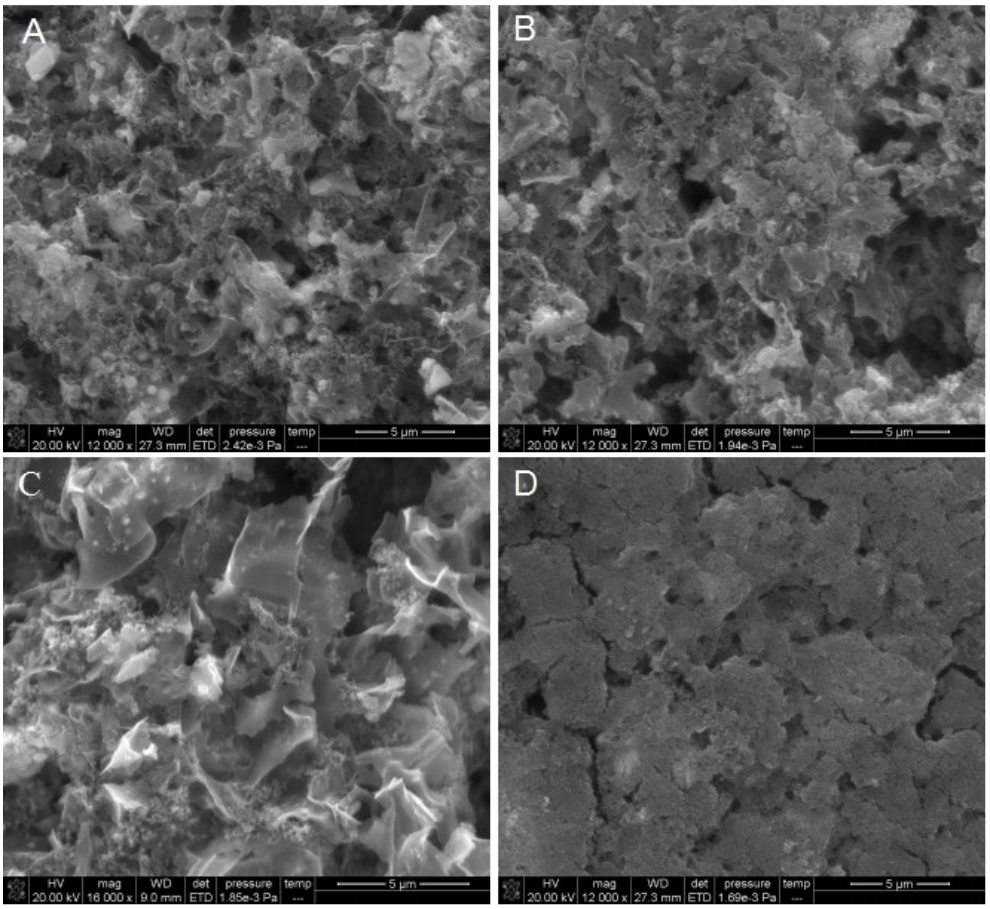

Fig. S8 SEM images of $Sn/SnO_x/MoS_2/C$ and $Sn/SnO_x/C$ electrode before cycle (A,C) and after 500 cycles (B,D) at a current density of 1A/g.

Table S1 A summary of recent studies on MoS_2-based electrode for lithium-ion battery

Materials	**Cycling stability ($mAh\ g^{-1}$)**	**Rate capability ($mAh\ g^{-1}$)**	**Ref**
MoS_2 Nanosheets Supported on N-doped Carbon Nanoboxes	952 at 0.4 A g^{-1} (200 cycles)	403 at 8.0 A g^{-1}	23
MoS_2 Embedded in Carbon Nanofibers	661 at 10 A g^{-1} (1000 cycles)	374 at 50 A g^{-1}	24
Hierarchical MoS_2	957 at 0.1 A g^{-1} (50 cycles)	800 at 1 A g^{-1}	25
MoS_2/reduced graphene oxide	1050 at 0.1 A g^{-1} (100 cycles)	875 at 1 A g^{-1}	27
MoS_2@graphene nanocables	1150 at 0.5 A g^{-1} (150 cycles)	700 at 10 A g^{-1}	28
SnO_2/MoS_2	700 at 1 A g^{-1} (50 cycles)	200 at 4 A g^{-1}	37
Sn/MoS2/C	624 at 1 A g^{-1} (500 cycles)	630 at 2 A g^{-1}	49
MoS_2/graphene	309 at 10 A g^{-1} (1800 cycles)	303 at 30 A g^{-1}	S1
Nitrogen-Doped Carbon Embedded MoS_2 Microspheres	1050 at 0.15 A g^{-1} (300 cycles)	550 at 3 A g^{-1}	S2
Sn/SnOx/MoS2/C	725 at 3 A g^{-1} (800 cycles)	698 at 5 A g^{-1}	this work

1. Y. Liu, X. Z. Wang, X. D. Song, Y. F. Dong, L. Yang, L. X. Wang, D. Z. Jia, Z. B. Zhao, J. S. Qiu, Carbon, 2016, 109, 461.
2. D. Xie, X. H.Xia, Y. D. Wang, D. H. Wang, Y. Zhong, W. J. Tang, X. L. Wang, and J. P. Tu, Chem. Eur. J. 2016, 22, 11617.