Supporting Information

Strongly Coupled 3D SnS_2@$Ti_3C_2T_x$ heterojunction with vacancies for high-efficiency sodium storage

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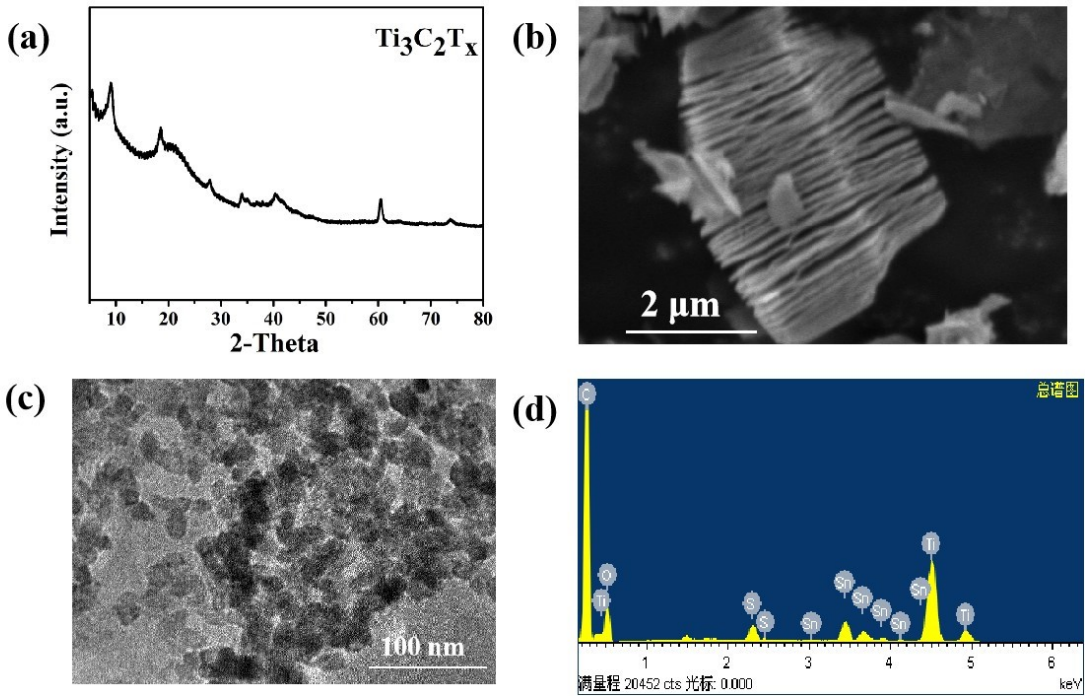

Fig. S1 (a) The XRD pattern and (b) SEM of $Ti_3C_2T_x$. (c) TEM of SnS_2. (d) TEM-EDS of SnS_2@$Ti_3C_2T_x$ composites.

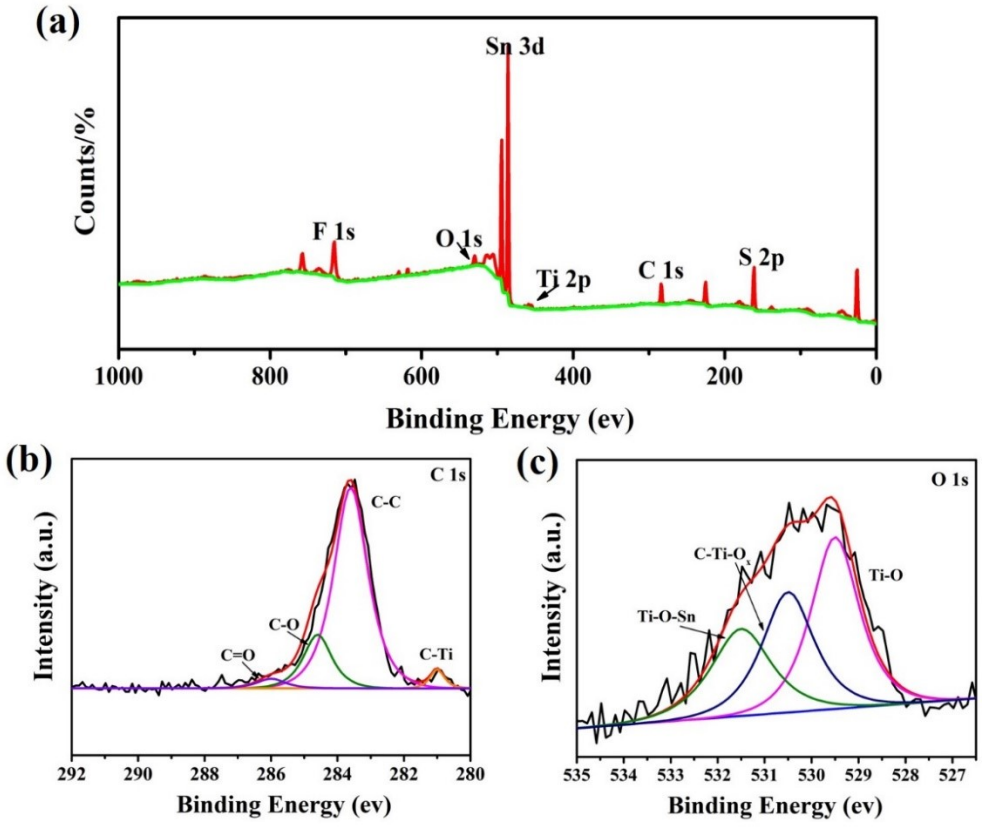

Fig. S2 XPS spectra of (a) full range, (b) C1s and (c) O1s of SnS_2@$Ti_3C_2T_x$.

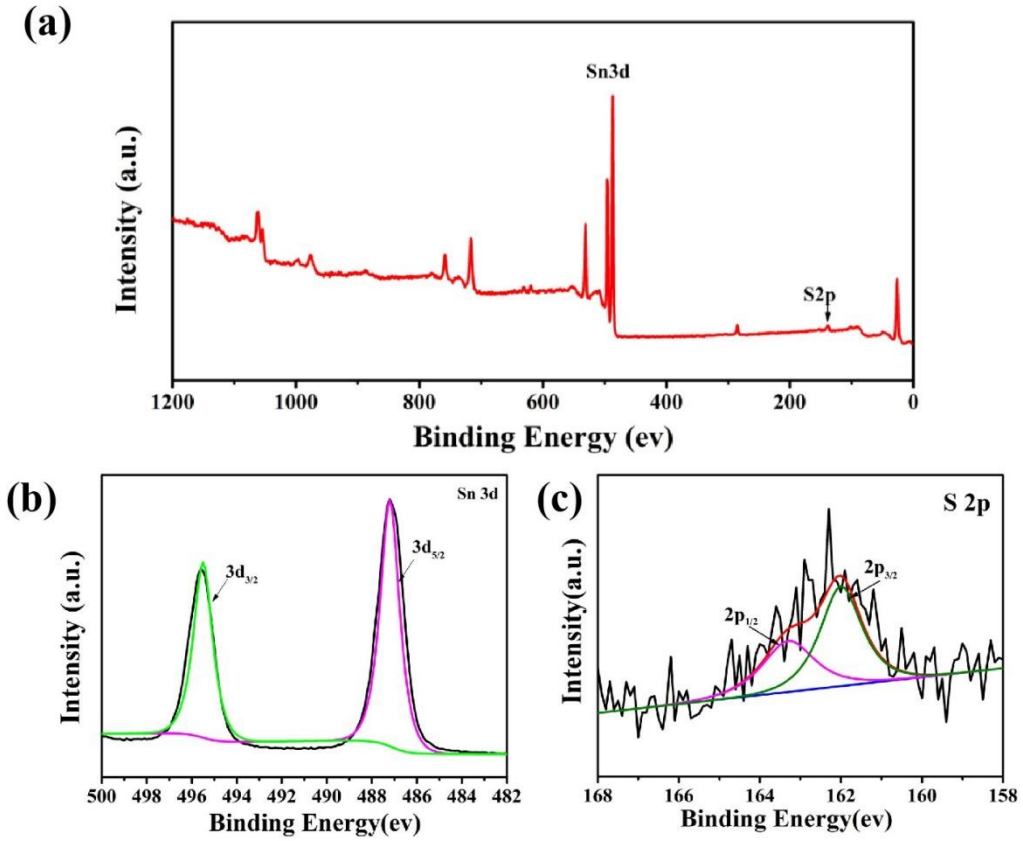

Fig. R3 XPS spectra of (a) full range, (b) Sn3d and (c) S2p of SnS_2.

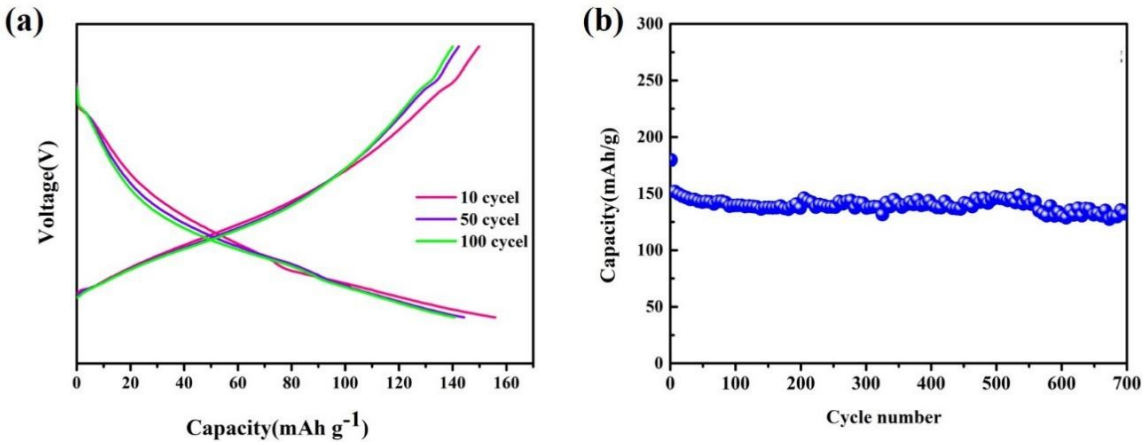

Fig. S4 (a) Charge-discharge curves and (b) cycling performance of $SnS_2@Ti_3C_2T_x$ at a current density of 200 mA g^{-1}.

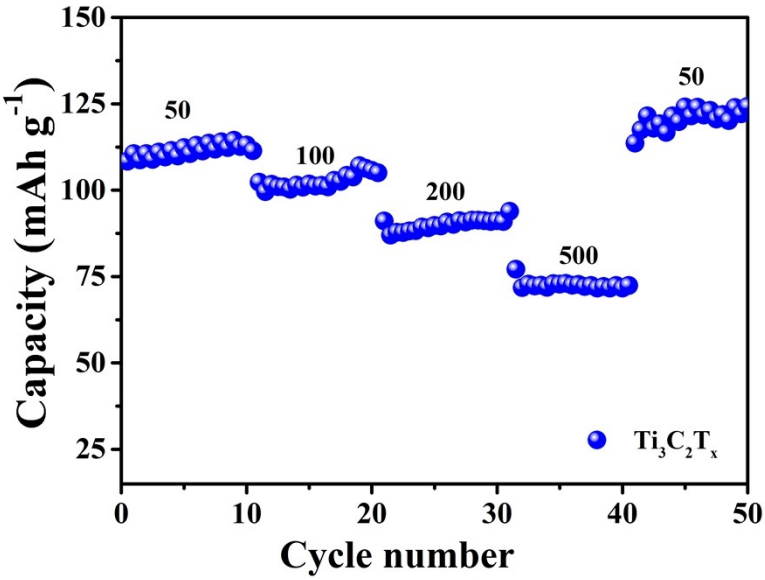

Fig. S5 The rate performance of $Ti_3C_2T_x$ at different current densities.

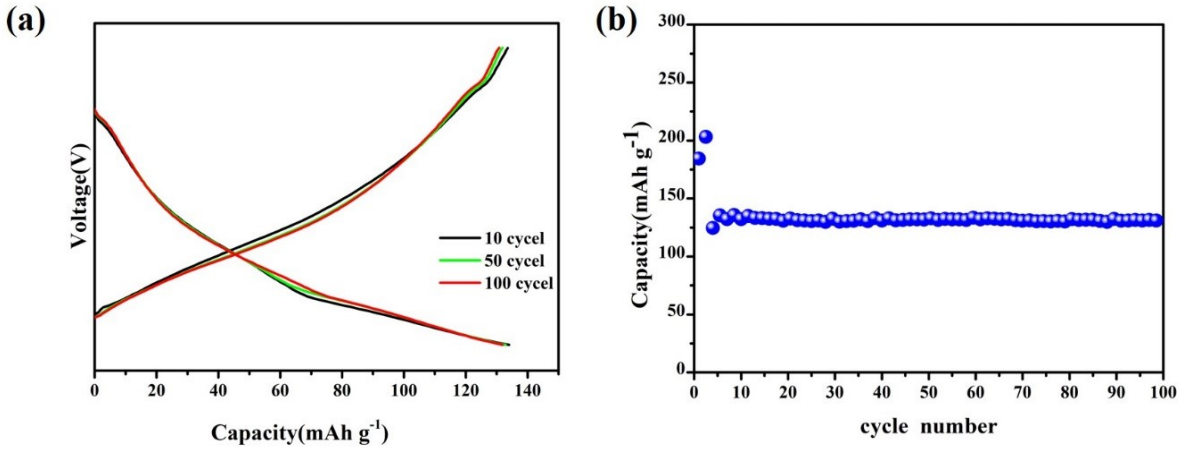

Fig. S6 (a) Charge-discharge curves and (b) cycling performance of $SnS_2@Ti_3C_2T_x$ at a current density of 500 mA g^{-1}.

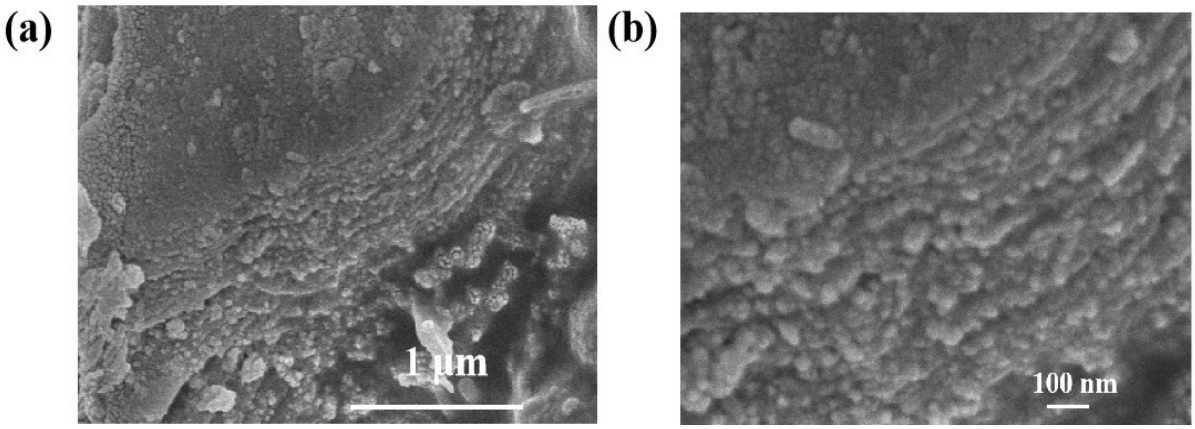

Fig. S7 (a-b) SEM of $SnS_2@Ti_3C_2T_x$ after 1000 cycles at 500 mA g^{-1}.

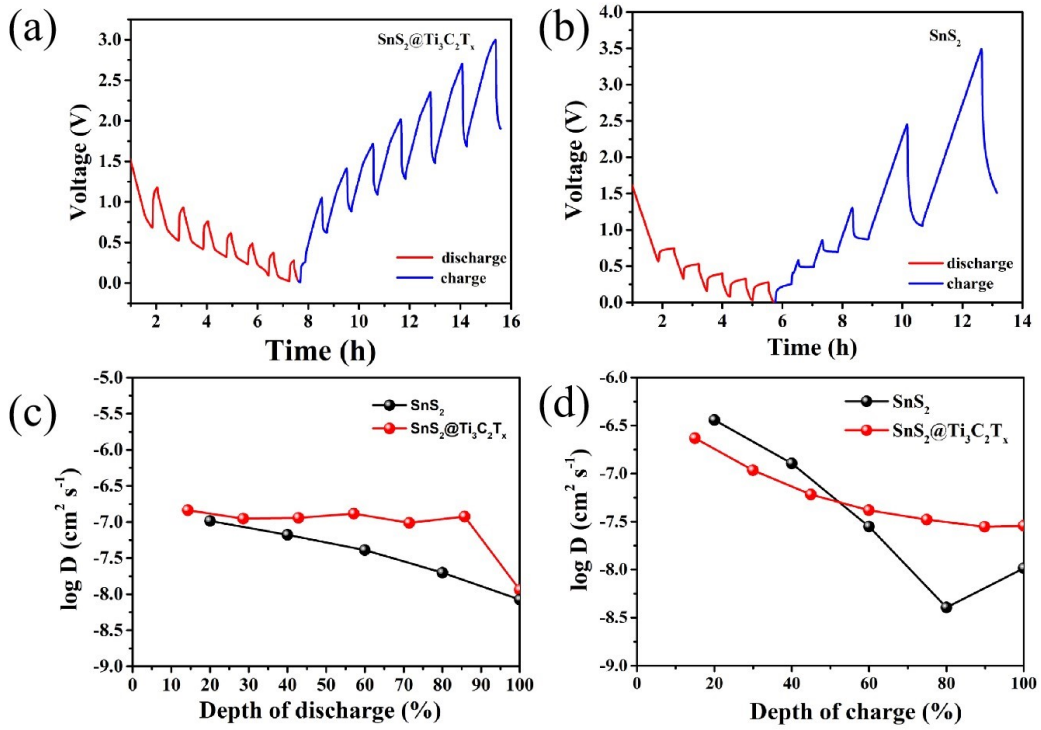

Fig. S8 (a-b) The GITT profiles of $SnS_2@Ti_3C_2T_x$ and SnS_2. (c-d) Their corresponding diffusion coefficients of Na^+ calculated from the GITT tests.

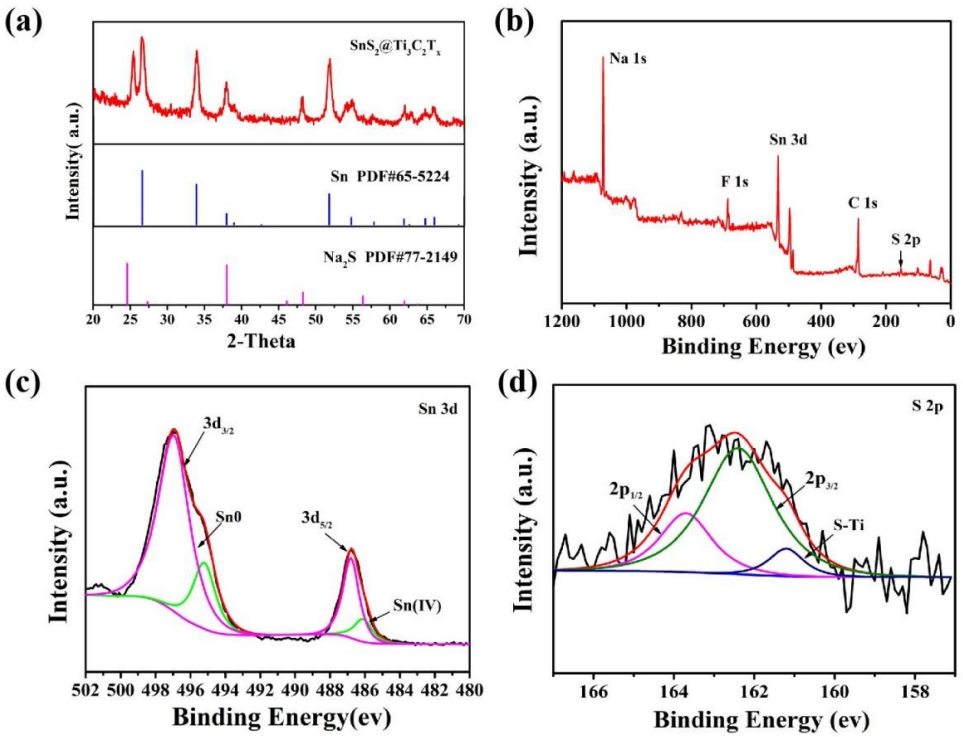

Fig. S9 (a) The XRD pattern of $SnS_2@Ti_3C_2T_x$ after the first complete discharge. (b-c) XPS spectra of full range, Sn3d and S2p of $SnS_2@Ti_3C_2T_x$ after the first complete discharge.

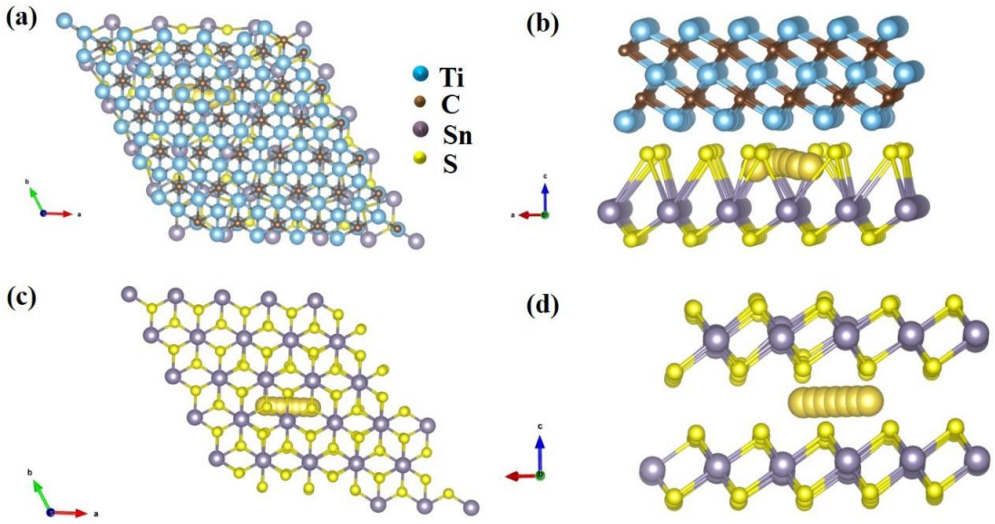

Fig. S10 (a) Diffusion path model of sodium ion in $SnS_2@Ti_3C_2T_x$ and (b) corresponding magnification model diagram. (c) Diffusion path model of sodium ion in SnS_2 and (d) corresponding magnification computational model.