Electronic Supplementary Information

One-step synthesis of SnO_x nanocrystalline aggregates encapsulated by amorphous TiO_2 as anode in Li-ion battery

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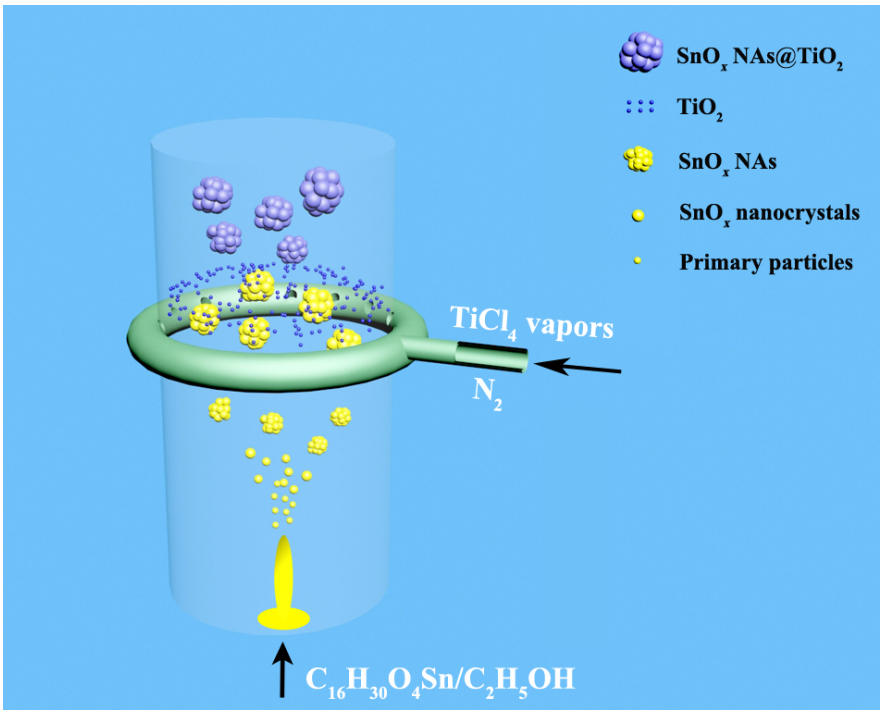

Figure S1 Schematic diagram of FSP process for SnO_x NAs@TiO_2.

The FSP process includes two parts: flame synthesis of SnO_x NAs and then in situ encapsulation of TiO_2 on fresh SnO_x NAs. The tin source dissolved in the ethanol had been sprayed into flame and decomposed into primary particles, grown into SnO_x nanocrystallines and aggregated into aggregations owing to the unique characteristics of FSP. The $TiCl_4$ vapors were introduced through the quenching ring with the acid of carrying N_2 gas. Then the $TiCl_4$ hydrolyzed into TiO_2 and heterogeneously nucleated on the surface of SnO_x NAs, finally forming the core-shell structure of SnO_x NAs@TiO_2.

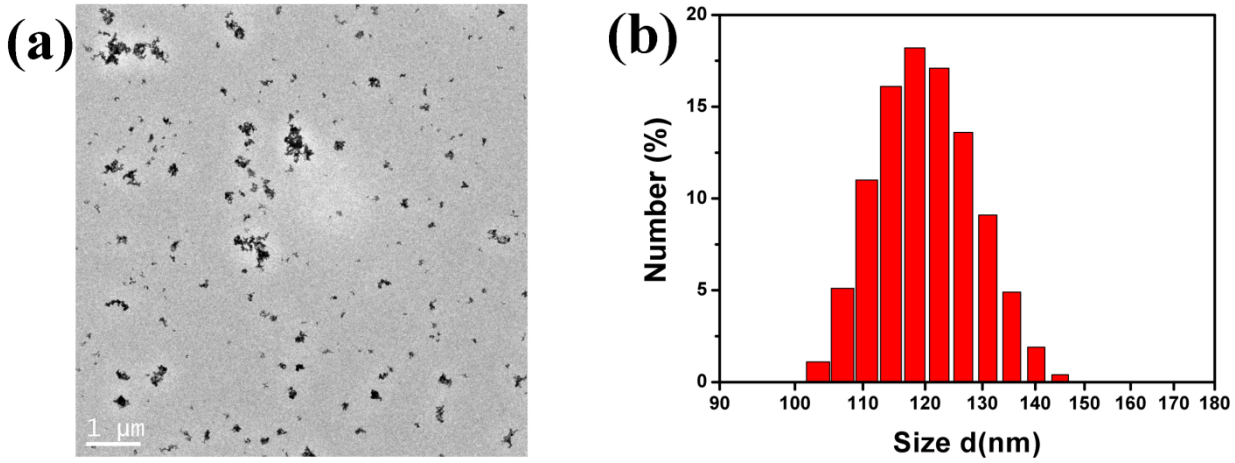

Figure S2 (a) TEM image and (b) particle size distribution of SnO_x NAs@TiO_2

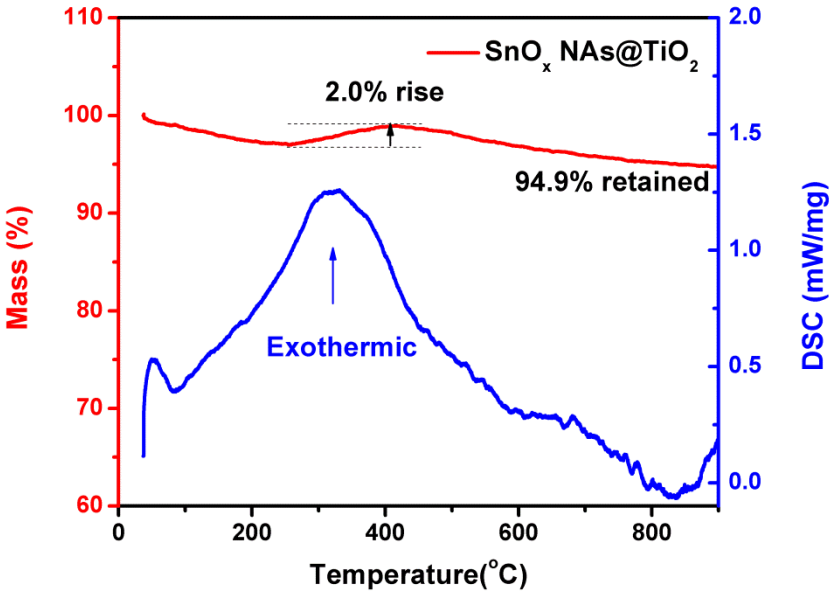

Figure S3 TGA and DSC curves of SnO_x NAs@TiO_2

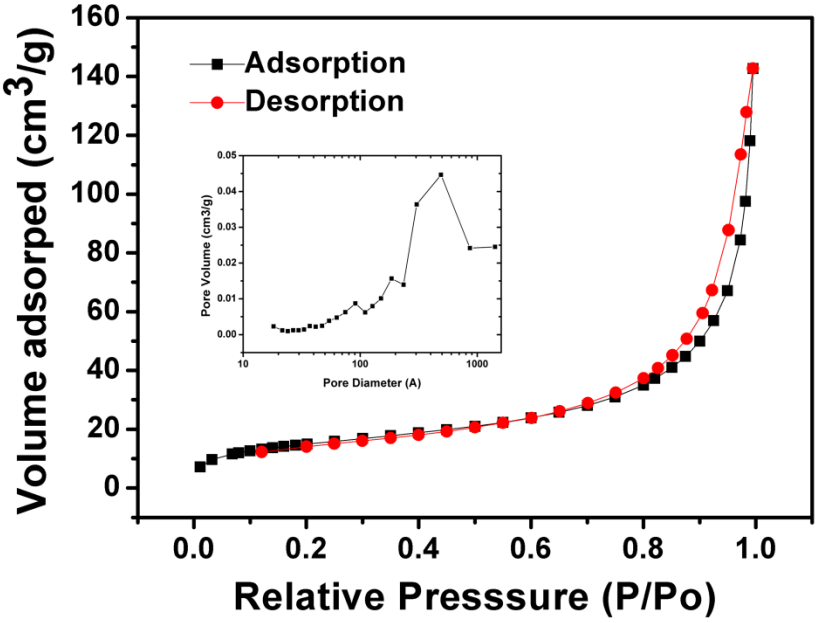

Figure S4. BET of SnO_x NAs@TiO_2 (inset of Pore volume/diameter)

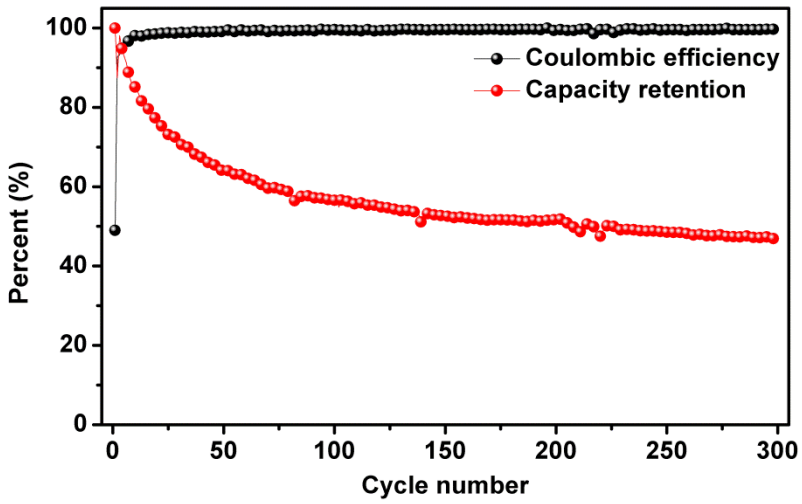

Figure S5. Coulomb efficiency and capacity retention of SnO_x NAs@TiO_2 electrode

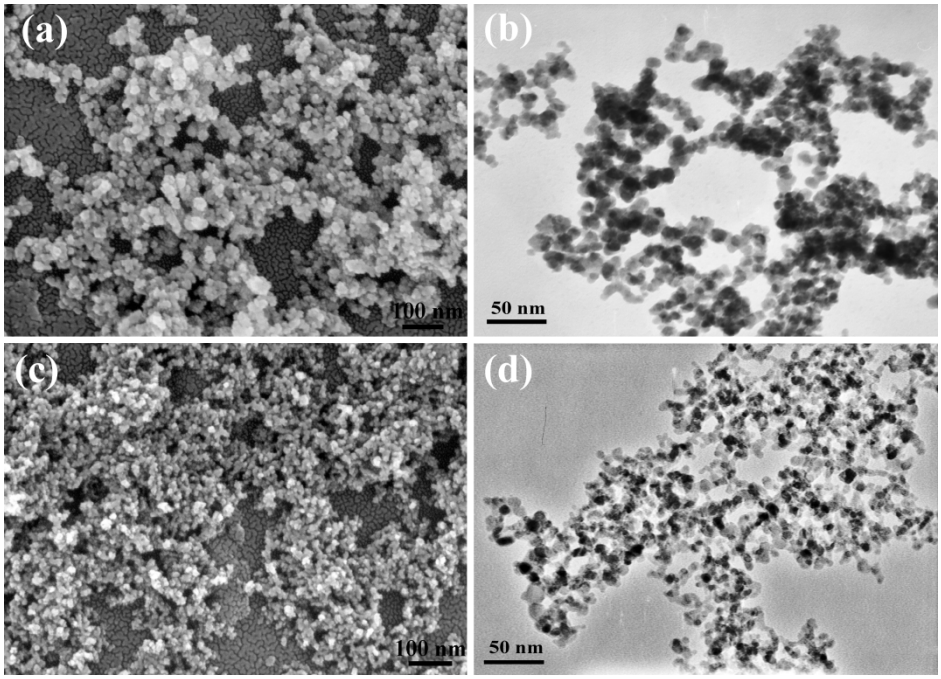

Figure S6. SEM and TEM images of as-prepared SnO_x NAs (a,b) and TiO_2 NAs (c,d)

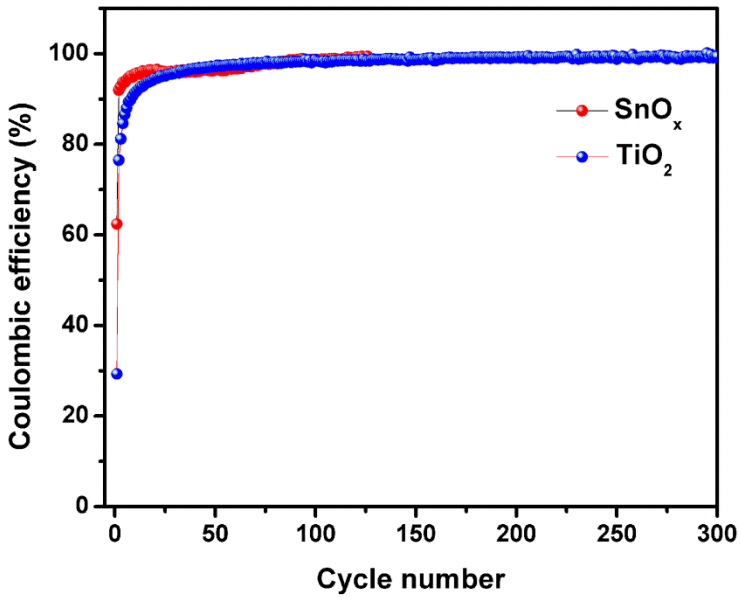

Figure S7. Coulomb efficiency of SnO_x NAs and TiO_2 NAs electrodes.

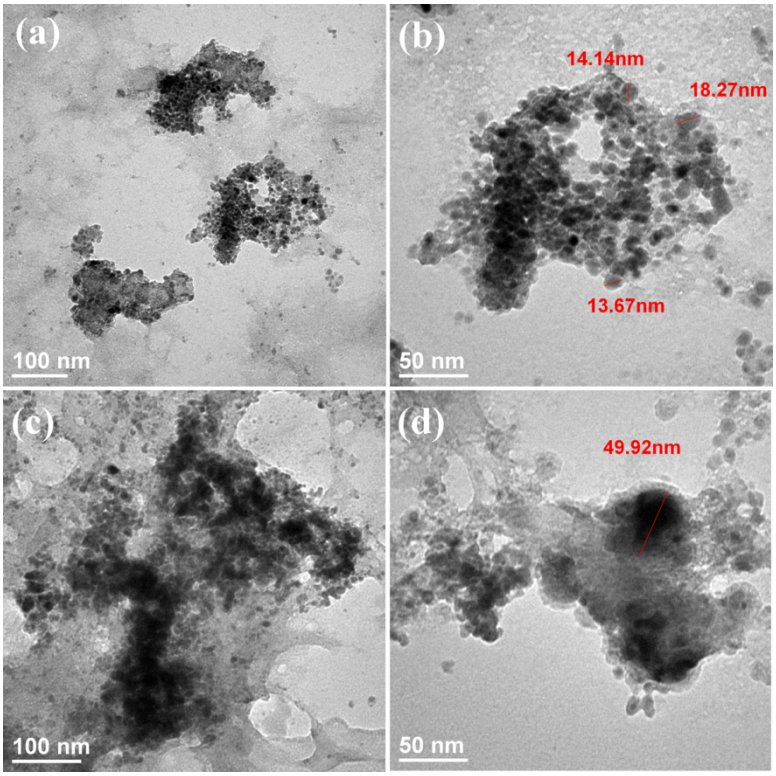

Fig. S8 TEM images of SnO_x NAs@TiO_2 (a,b) and SnO_x NAs (c,d) after 50 cycles, respectively.