## **Supporting Information**



Figure S1 The schematic illustration of material preparation process from SnSb-alloy to carbon coated nanoporous  $SnO_xSb$  alloy.



Figure S2 The  $N_2$  adorption-desorption curve (a) and corresponding pore size distributions (b) of the samples of NP-SnSb and NP-SnO<sub>x</sub>Sb@C.



**Figure S3** The SEM images of anodes. (left: NP-SnSb; right: NP-  $SnO_xSb@C$ ). (a) and (b) are the pristine anodes, the inset in (a) and (b) are high magnitude images of corresponding anodes; (c) and (d) are 15th cycled anodes.



Figure S4 TEM images of cycled anodes of NP- SnO<sub>x</sub>Sb@C.



Figure S5 An equivalent circuit model to fit the Nyquist plots.

**Table S1** The EIS fitting results of differentelectrode materials after cycing

$R_{ct}(\Omega)$	1st	5th	50th
NP-SnSb	75.61	45.32	118.5
			9
NP-SnO <sub>x</sub> Sb@C	120.19	45.18	59.67