

Electronic Supplementary Information for

**Chemical bonding in amorphous Si-coated carbon nanotubes as anodes for Li ion
batteries: a XANES study**

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1. TEM

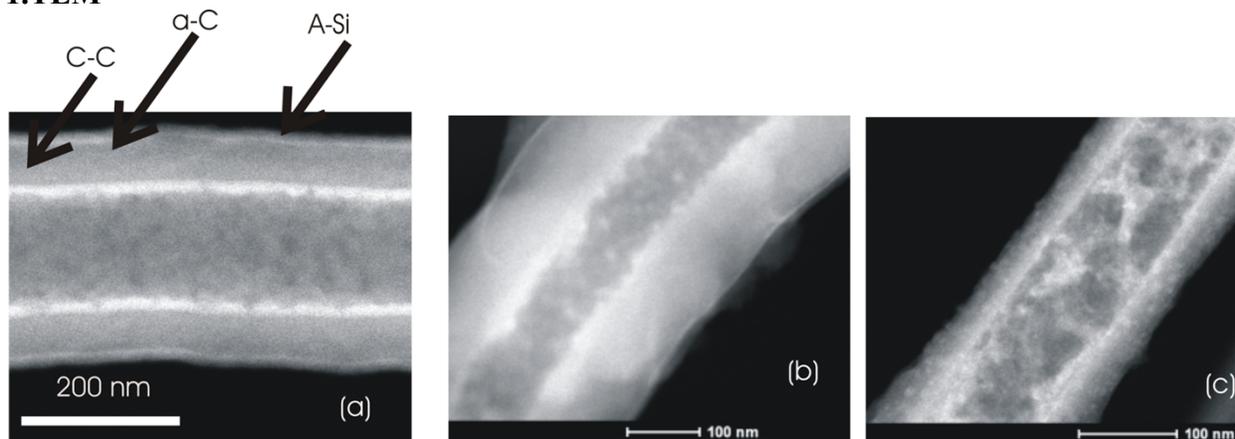


Fig.S1: TEM of Si-CNT (a), lithiated Si-CNT after 1 cycle (b), and lithiated Si-CNT after 100 cycles (c)

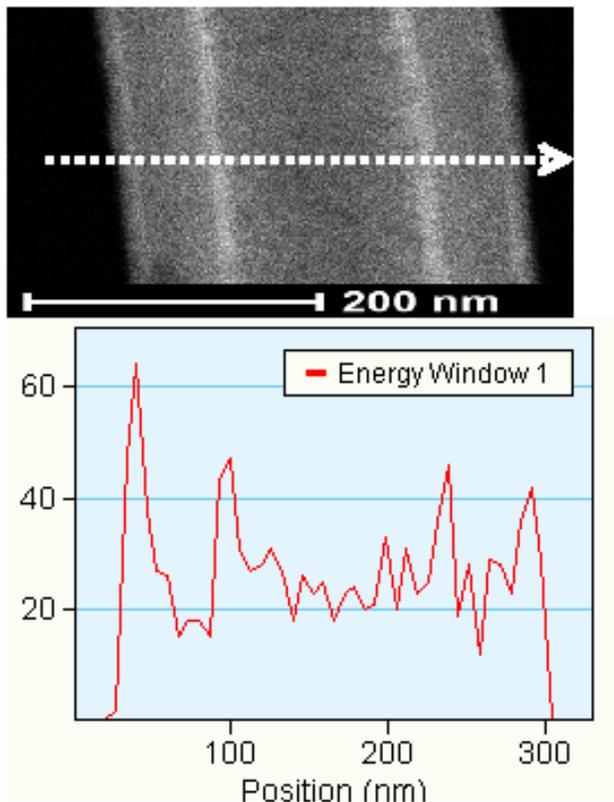


Figure S1(d) and (e): Scanning transmission electron microscopy high angle annular dark field image (top) and energy dispersive x-ray line scanning profile (bottom) showing the Si is distributed at both the inner and outside surface of the carbon fiber. The oxygen content is very low and cannot be mapped out.

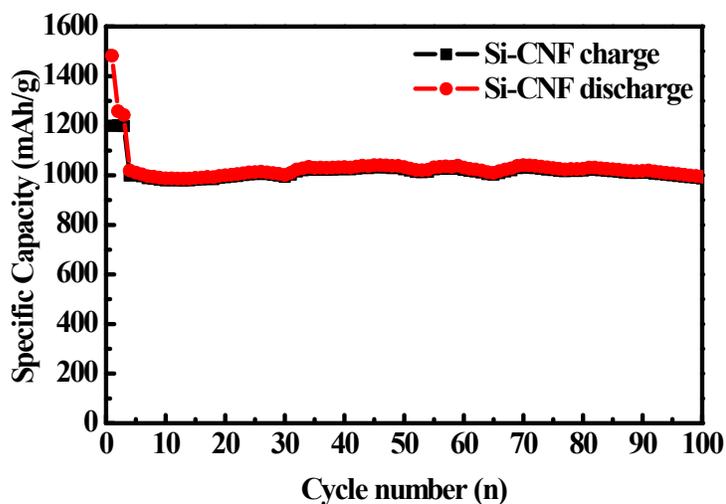


Figure S1(f): Specific capacity as a function of cycle number tested in a half cell configuration using Li metal as the counter-electrode and EC/DEC/10% FEC as the electrolyte

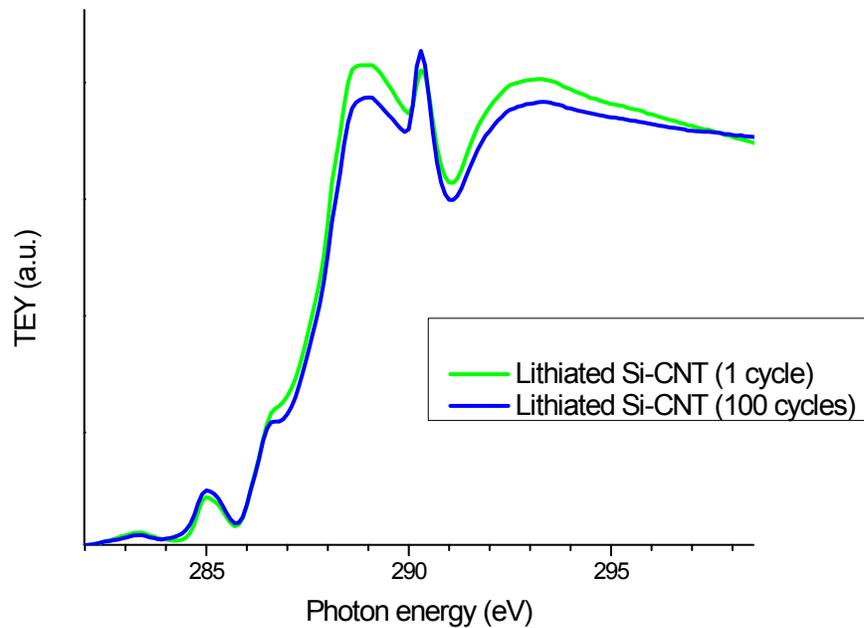


Fig.S2 : C K-edge XANES of lithiated Si-CNT at TEY. The strong peak at 290 eV (Li_2CO_3) relative to the weak C=C peak at 285 eV indicates the existence of passivation SEI layer on lithiated Si-CNT.

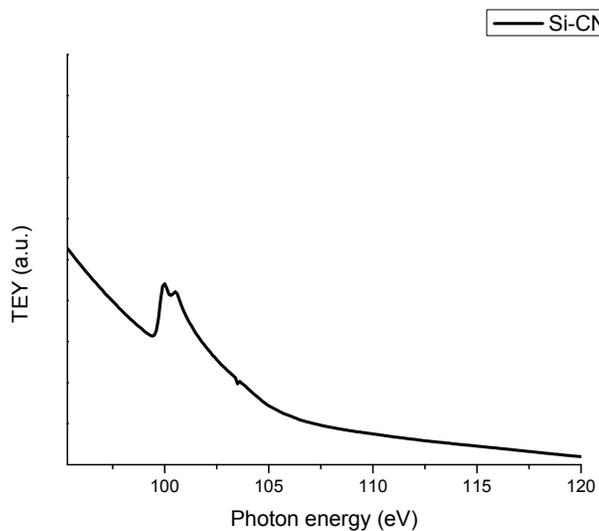


Fig. S3. Si L-edge of Si-CNT at TEY mode. It is clear with the surface sensitive TEY, there is no Si-O bond (at ~ 105 eV) detectable.

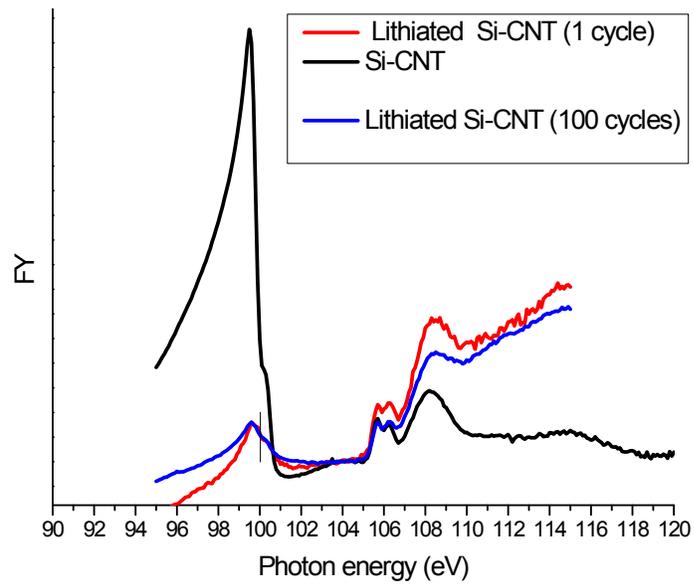


Fig. S4, Si L-edge of Si-CNT and lithiated Si-CNT at FY. Note the Elemental and Si-Li alloy at ~ 100 eV is inverted due to self absorption.