Supporting Information for

A Novel Tin-Bonded Silicon Anode for Lithium-ion Batteries

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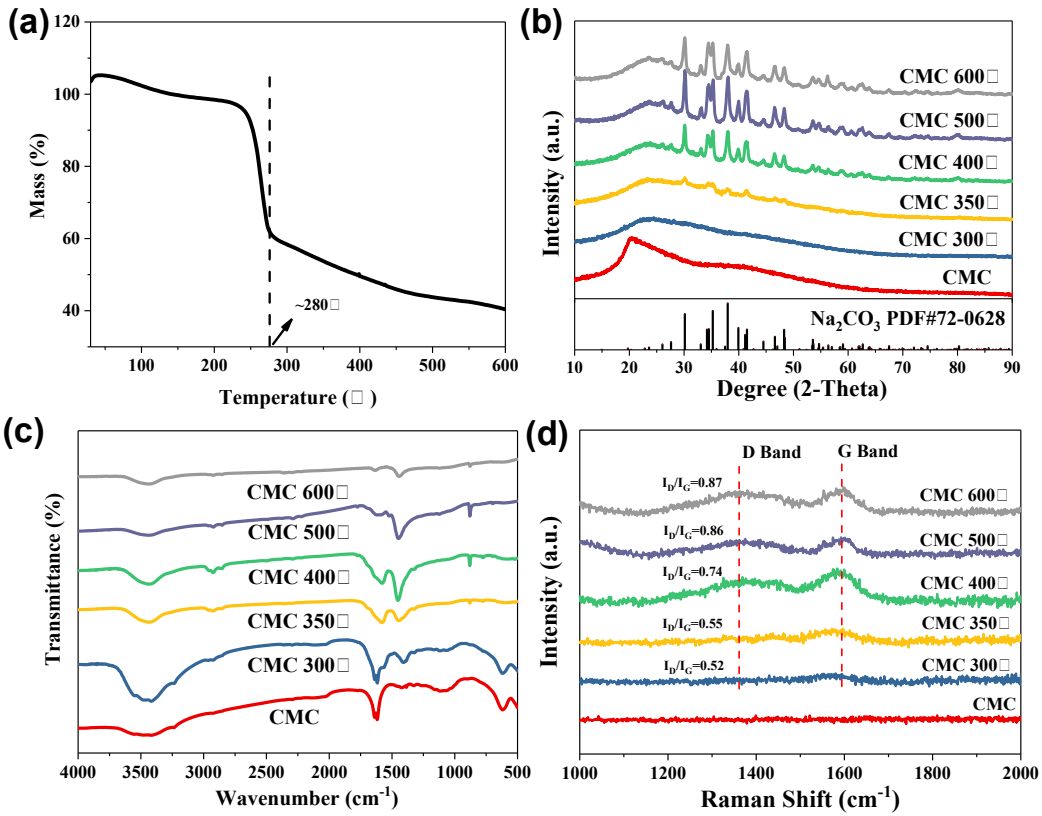

Figure S1. (a) TGA curve of the CMC, (b) XRD patterns, (c) FTIR results and (d) the Raman spectra of the CMC pyrolysed at different temperature.

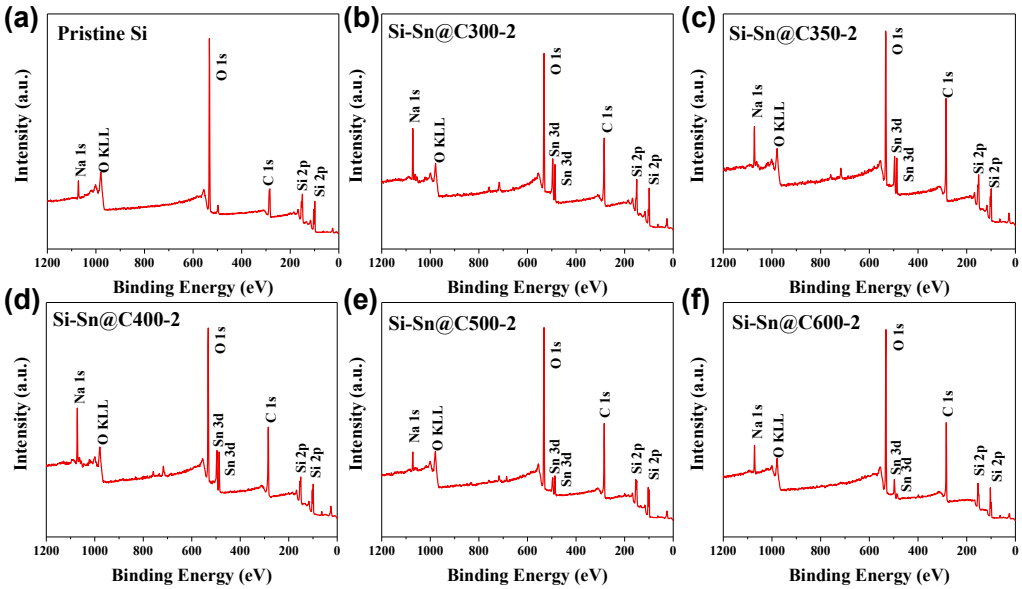

Figure S2. The survey XPS spectra of (a) pristine Si, (b) Si-Sn@C300-2, (c) Si-Sn@C350-2, (d) Si-Sn@C400-2, (e) Si-Sn@C500-2, and (f) Si-Sn@C600-2.

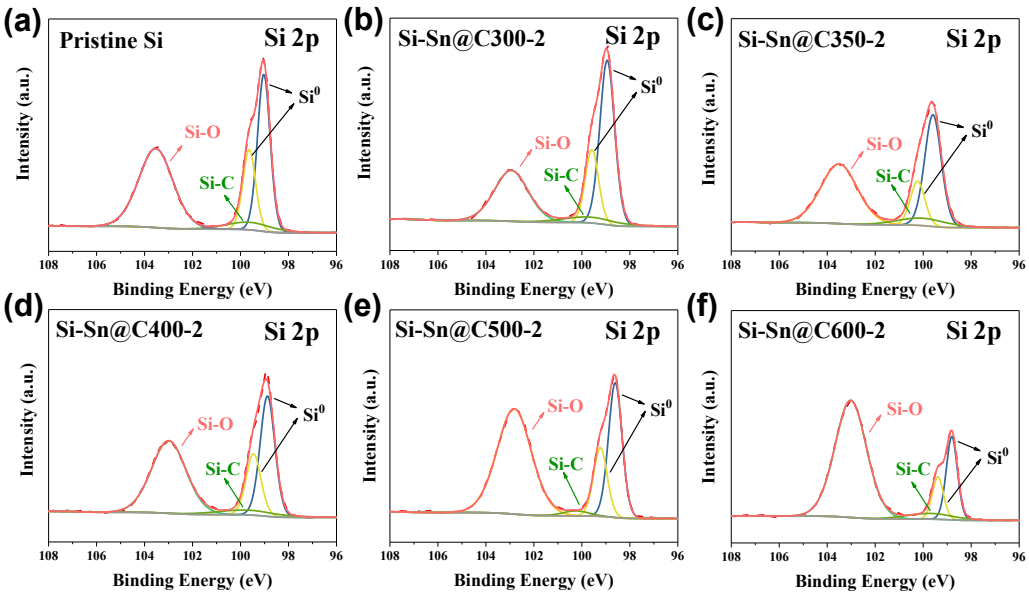

Figure S3. Si 2p XPS spectra of the (a) pristine Si, (b) Si-Sn@C300-2, (c) Si-Sn@C350-2, (d) Si-Sn@C400-2, (e) Si-Sn@C500-2 and (f) Si-Sn@C600-2 anodes.

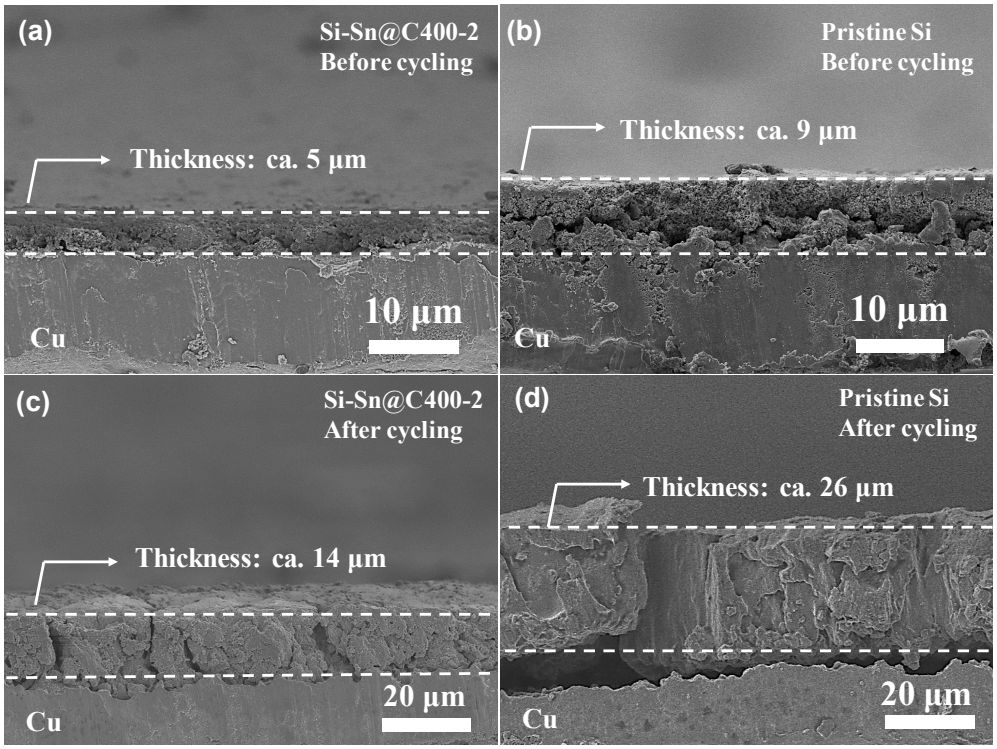

Figure S4. Cross-sectional morphologies before and after 100 cycles of (a,c) Si-Sn@C400-2 and (b,d) pristine Si electrodes, respectively.

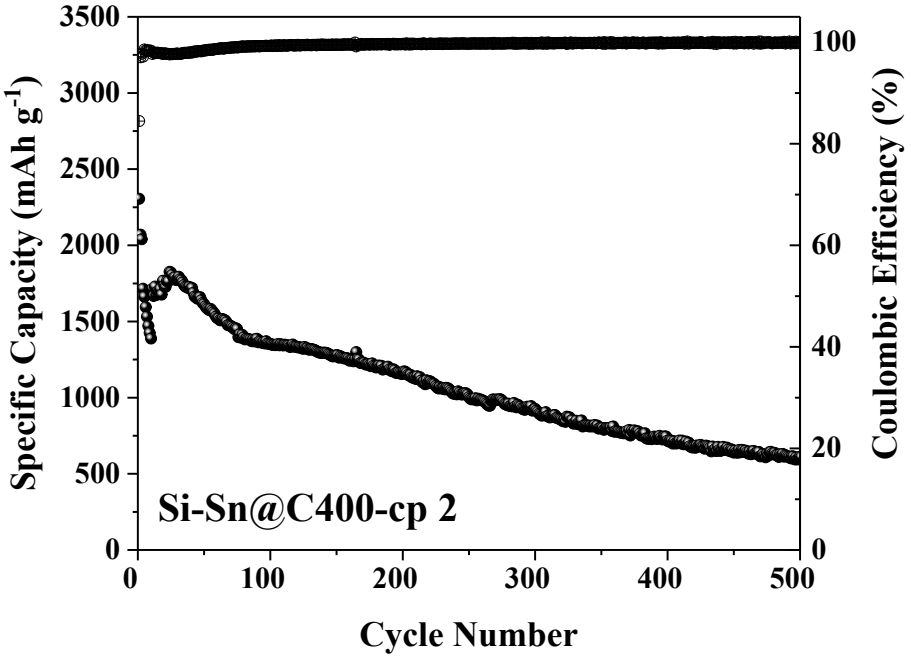

Figure S5. Long-term cycling performances of the Si-Sn@C400-cp2 anode at 1500 mA g^{-1}. The electrodes are first cycled at 150 mA g^{-1}, followed by 300 mA g^{-1} for the 2nd and 3rd cycles.

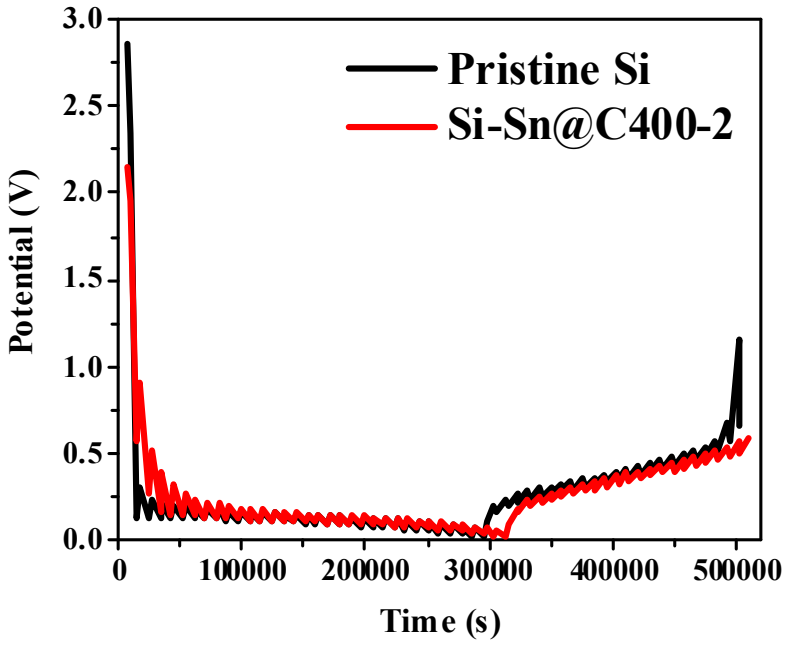

Figure S6. GITT curves for initial discharge/charge state of Si-Sn@C400-2 and the pristine Si anodes.

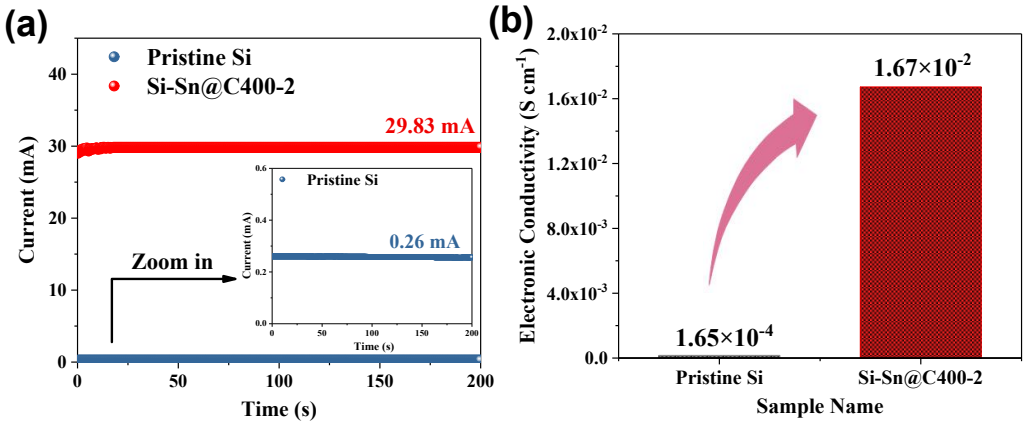

Figure S7. (a) DC polarization plots and (b) the resultant electronic conductivity of the pristine Si and Si-Sn@C400-2 anodes.

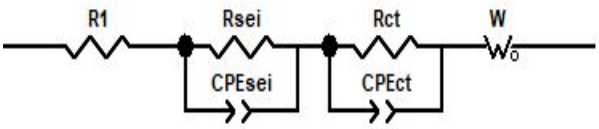

Figure S8. The equivalent circuit of the EIS spectra.

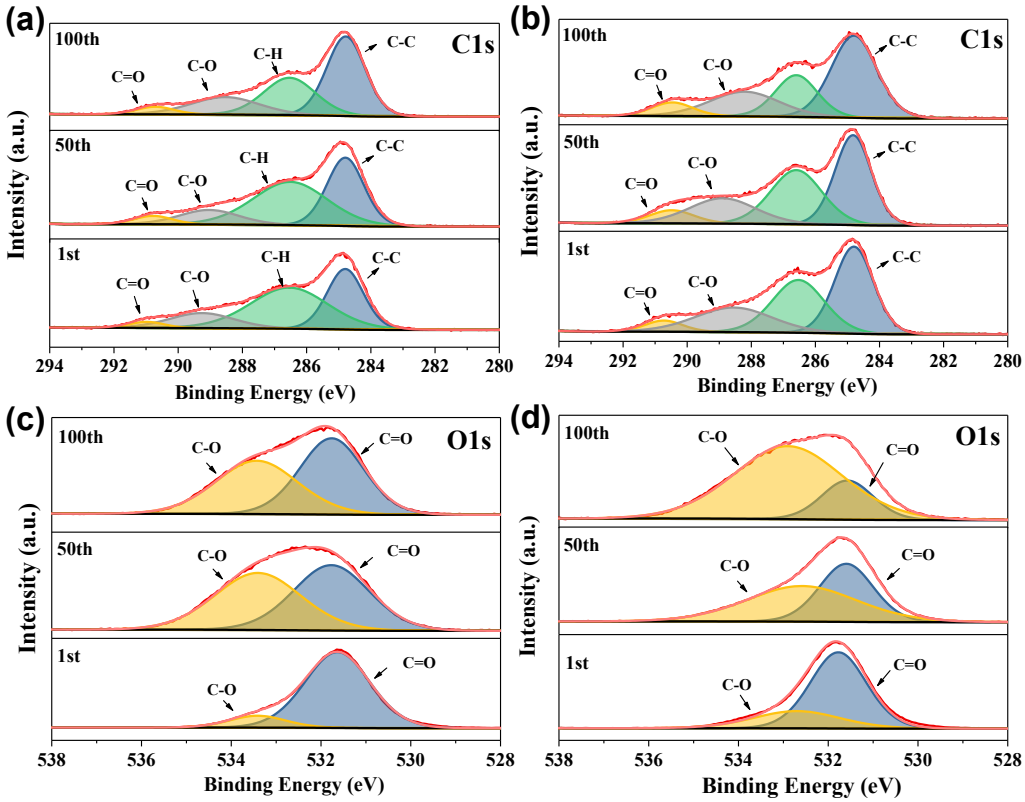

Figure S9. C 1s and O 1s XPS spectra of (a, c) the Si-Sn@C400-2 and (b, d) the pristine Si electrodes at selected cycles, respectively.