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Supporting information

Understanding problems of lithiated anode in lithium oxygen full-cells

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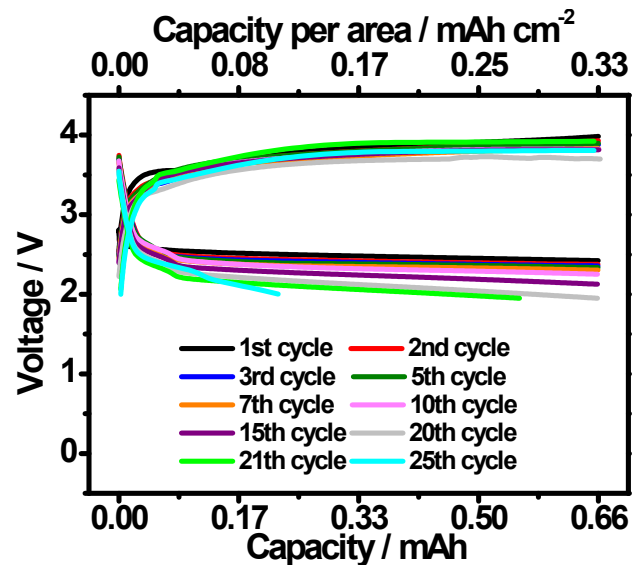


Fig. S1 Further cycling data of Fig. 1d clearly showing the cell failure. Cell test was stopped at the 26th cycle for further analysis.

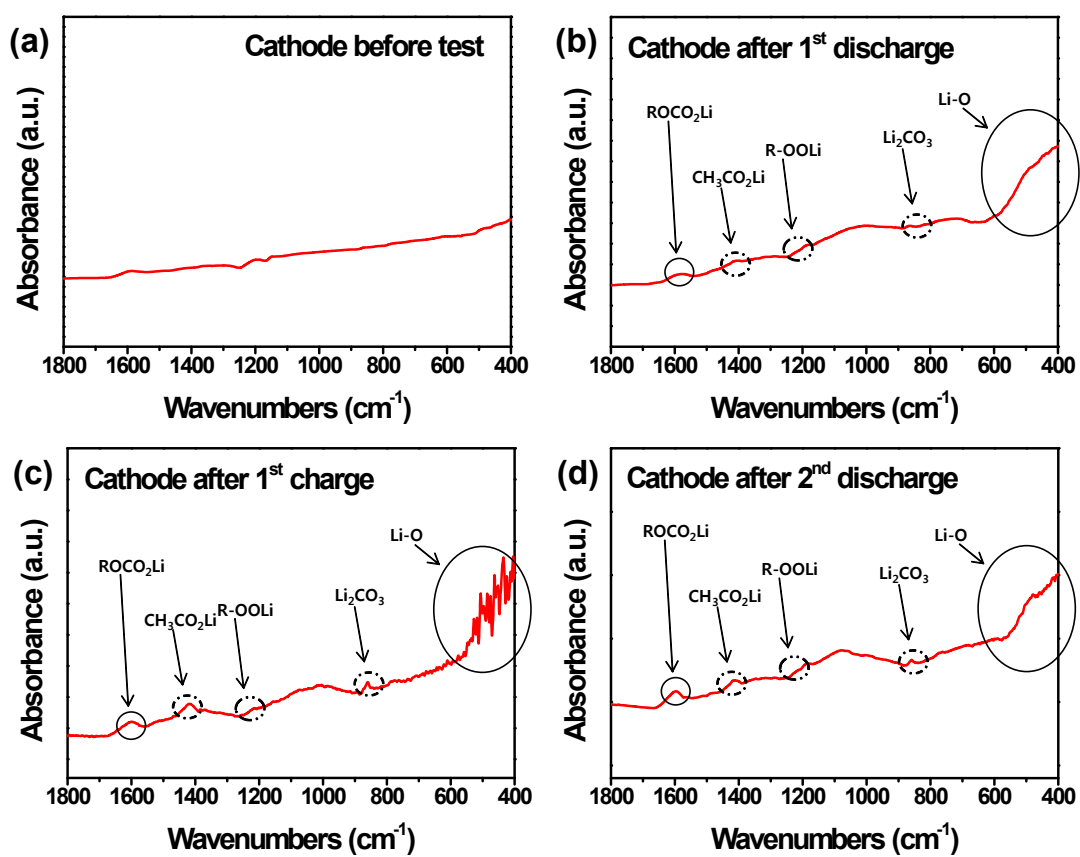


Fig. S2 FT-IR results of the cathode (air electrode). (a) before test, after (b) 1st discharge, (c) 1st charge, and (d) 2nd discharge.

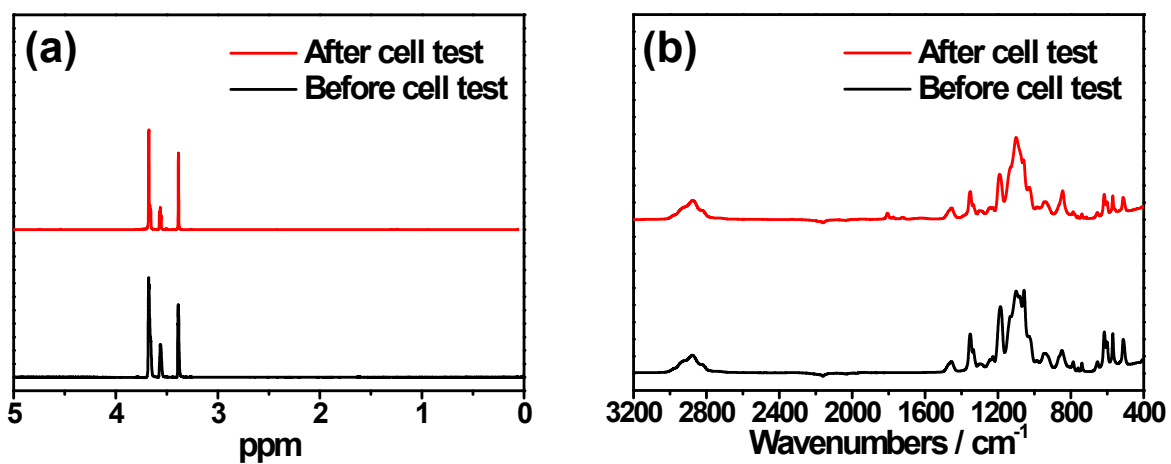


Fig. S3 NMR and FTIR spectra of the electrolyte. (a) NMR and (b) FTIR spectra of the electrolyte (1M LiTFSI in tetraglyme) before and after the galvanostatic cell test in a Li_xSi-CNT/O₂ full-cell. The cell tests were continued until cell failure for the purpose of comparison.

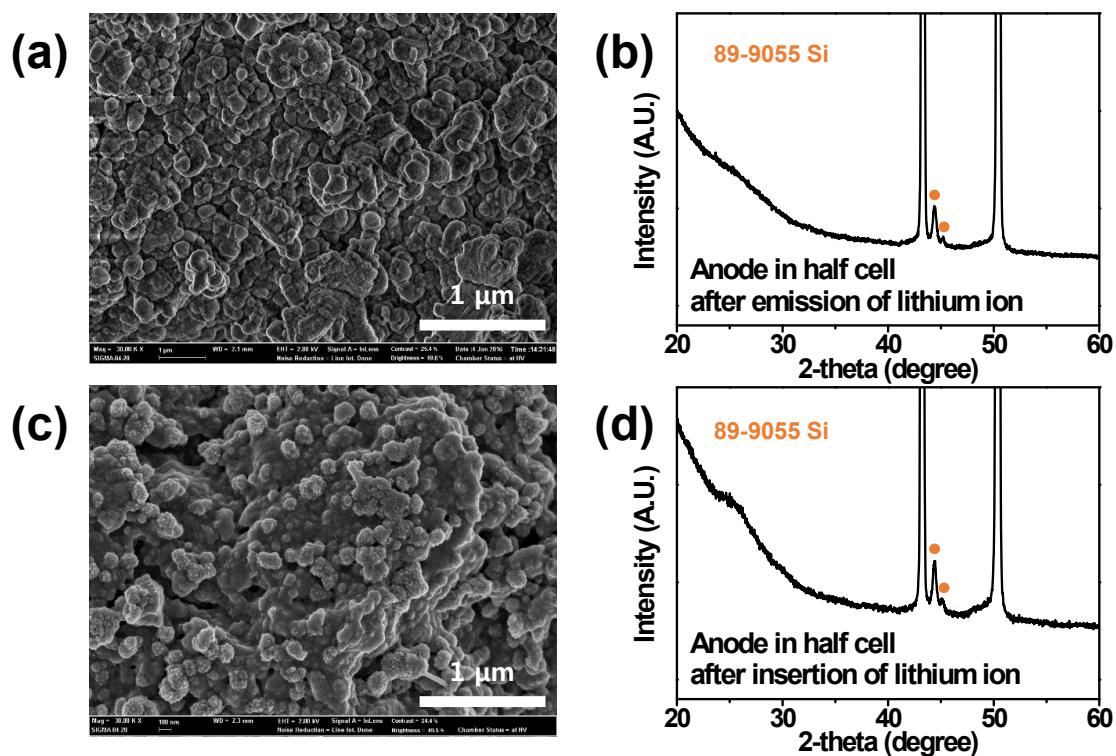


Fig. S4 SEM image and XRD pattern results of the $\text{Li}_x\text{Si-CNT}$ electrode in $\text{Li}/\text{Li}_x\text{Si-CNT}$ half-cells. After galvanostatic (a, b) charge (emission of Li ion from $\text{Li}_x\text{Si-CNT}$ to Li metal) and (c, d) discharge (insertion of Li ion from $\text{Li}_x\text{Si-CNT}$ to Li metal) in $\text{Li}/\text{Li}_x\text{Si-CNT}$ half-cells. The expression of discharge and charge are altered because in this anode closed cell, $\text{Li}_x\text{Si-CNT}$ is the working electrode and Li metal is the counter electrode.