

Supplementary Information

Improvement of Lithium Anode Deterioration for Ameliorating Cyclabilities of Non-aqueous Li-CO₂ Batteries

Chih-Jung Chen,^a Jun-Jie Yang,^b Chien-Hung Chen,^b Da-Hua Wei,^{*b} Shu-Fen Hu^{*c}
and Ru-Shi Liu^{*ab}

^a *Department of Chemistry, National Taiwan University, Taipei 106, Taiwan*

^b *Department of Mechanical Engineering and Graduate Institute of Manufacturing Technology, National
Taipei University of Technology, Taipei 106, Taiwan*

^c *Department of Physics, National Taiwan Normal University, Taipei 116, Taiwan*

* E-mail: dhwei@ntut.edu.tw; sfhu.hu@ntnu.edu.tw; rsliu@ntu.edu.tw

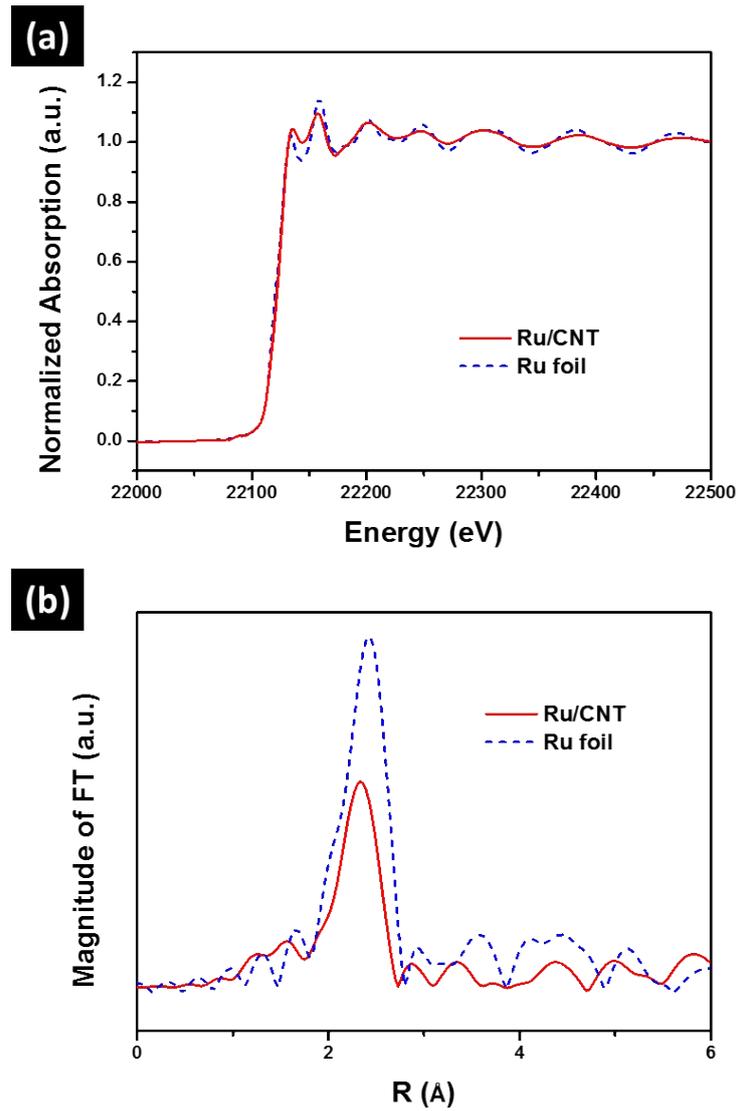


Fig. S1 Mo K-edge (a) XANES spectra and (b) radial distribution for Fourier transform k^2 -weighted EXAFS signal of Ru/CNT catalyst material and Ru foil standard.

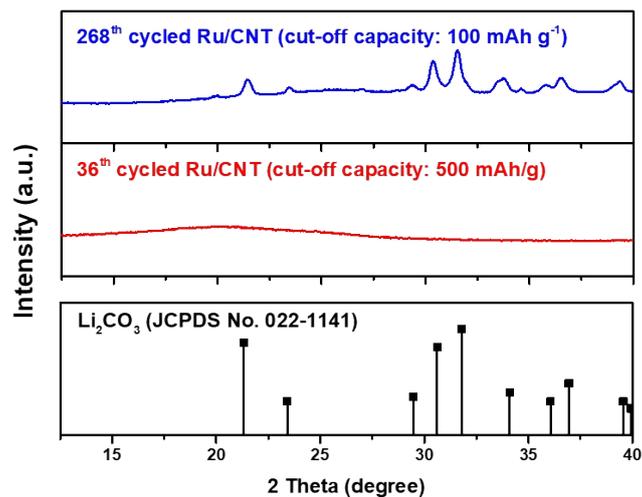


Fig. S2 Ex-situ grazing incidence synchrotron XRD spectra of Ru/CNT catalyst cathode after the cycling test at a current density of 100 mA g⁻¹ with different cut-off capacity conditions.

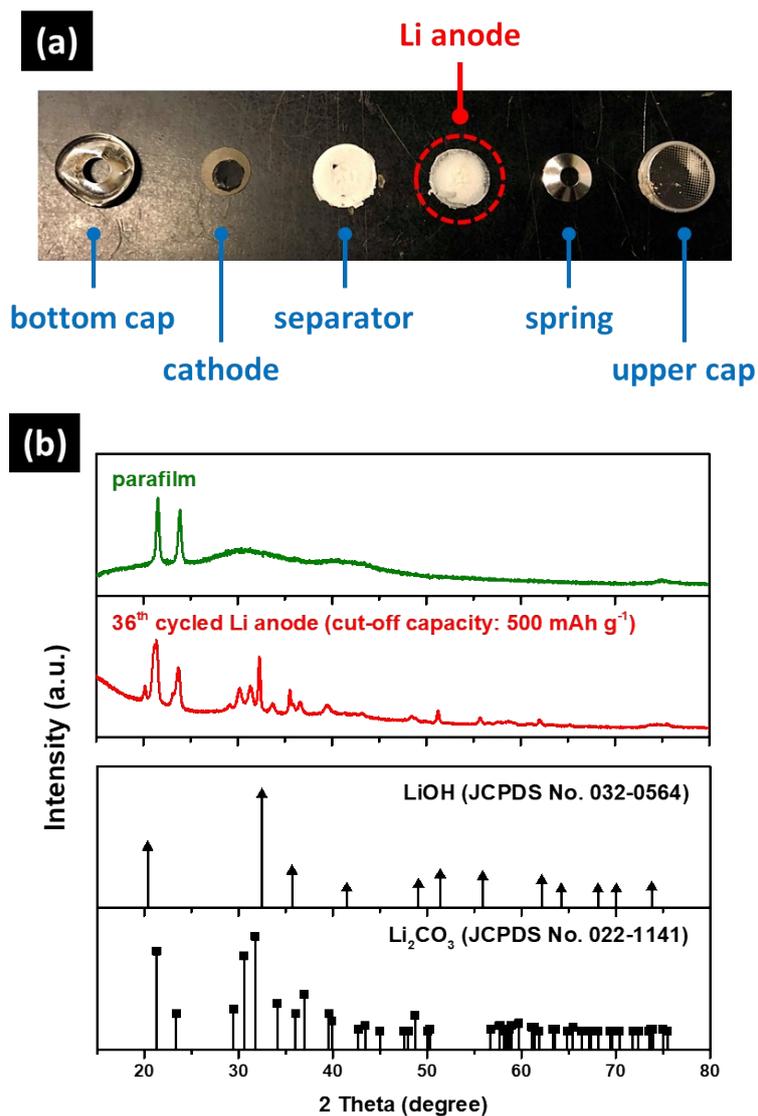


Fig. S3 (a) Photograph of disassembled coin cell after cycling at a current density of 100 mA g^{-1} with a cut-off capacity of 500 mAh g^{-1} . (b) Ex-situ in-house XRD profile of Li anode after cycling measurement at a current density of 100 mA g^{-1} under a cut-off capacity of 500 mAh g^{-1} .

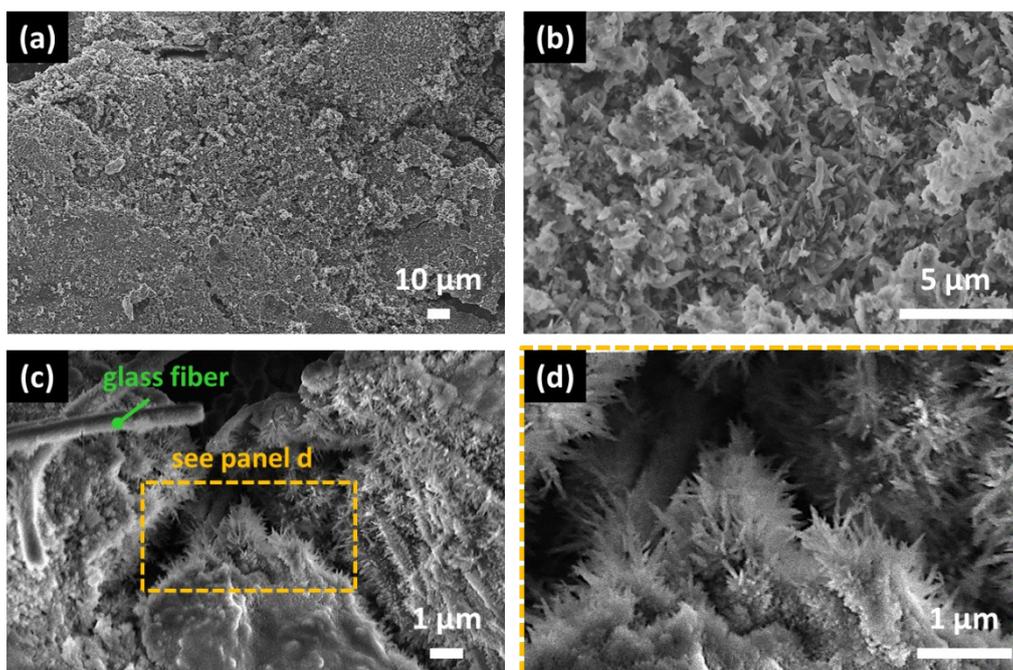


Fig. S4 (a-d) SEM images with different magnifications of Li anode after the cycling measurement under a cut-off capacity of 500 mAh g⁻¹.

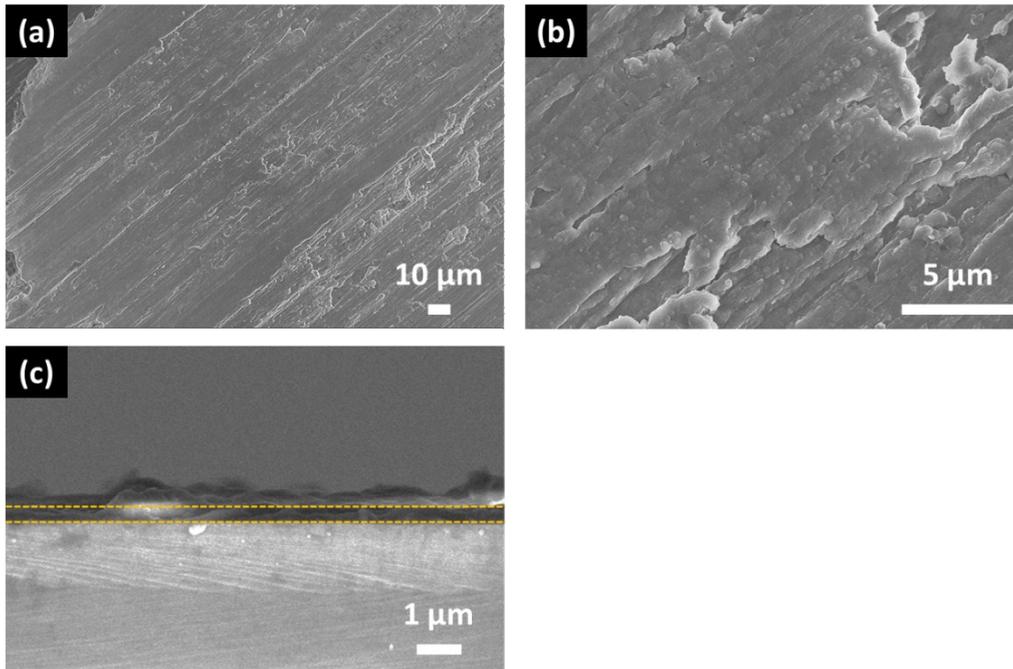


Fig. S5 (a-b) SEM images with different magnifications of C/Li anode. (C) Cross-sectional SEM image of C thin film (in-between two orange dash lines) on Si wafer for the thickness estimation.

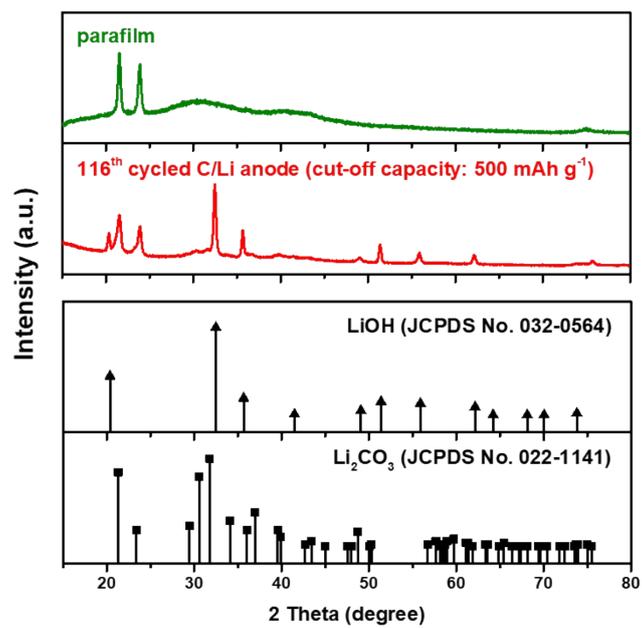


Fig. S6 Ex-situ in-house XRD profile of C/Li anode after cycling measurement at a current density of 100 mA g⁻¹ under a cut-off capacity of 500 mAh g⁻¹.

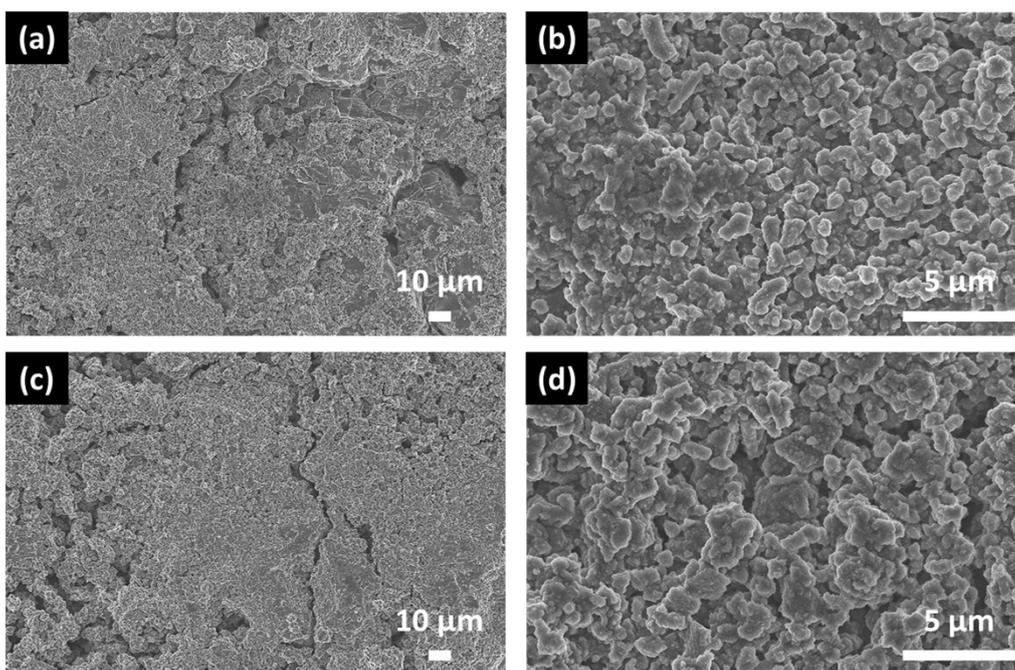


Fig. S7 (a-d) SEM images with different magnifications of various regions on C/Li anode after the cycling measurement under a cut-off capacity of 500 mAh g⁻¹.