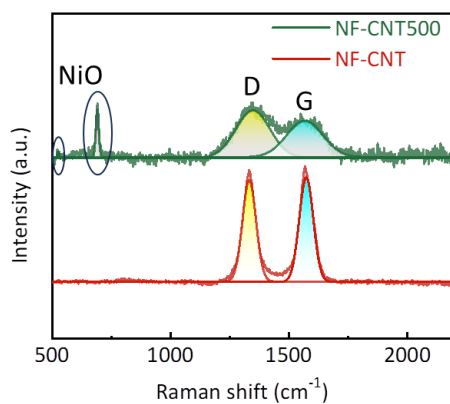
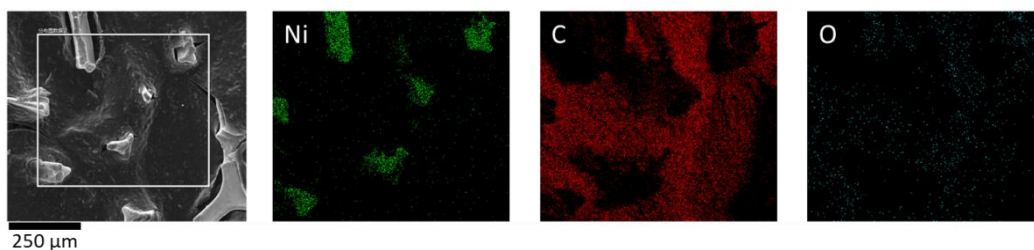


Supplementary Material

A hierarchical host microstructure enables regulated inner Li deposition for stable Li metal electrodes

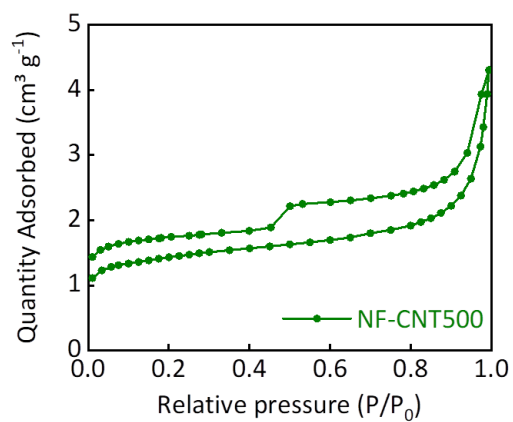
Supplementary Figure 1. Raman spectrum of NF-CNT and NF-CNT500



Supplementary Figure 2. SEM and EDS images of NF-CNT500.



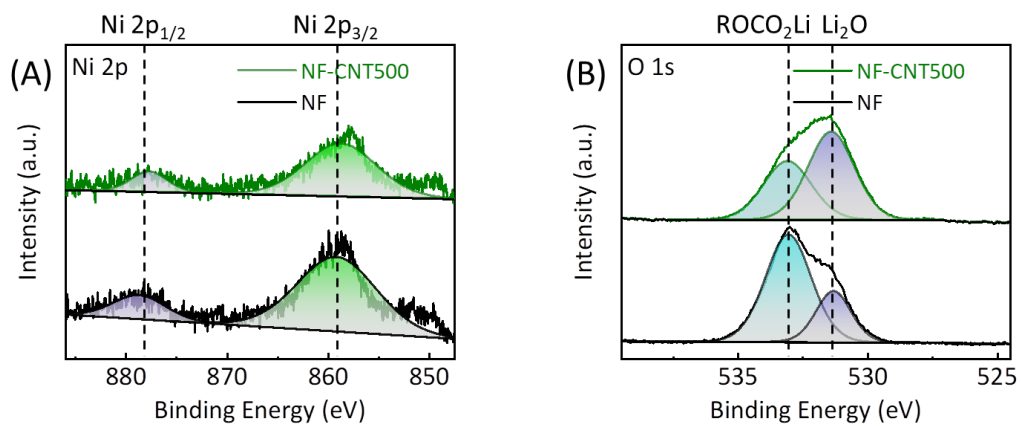
© The Author(s) 2024. Open Access This article is licensed under a Creative Commons Attribution 4.0 International License (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, sharing, adaptation, distribution and reproduction in any medium or format, for any purpose, even commercially, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made.



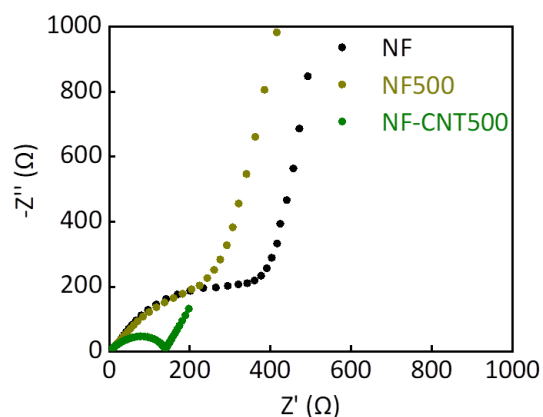
Supplementary Figure 3. BET measurement of NF-CNT500.



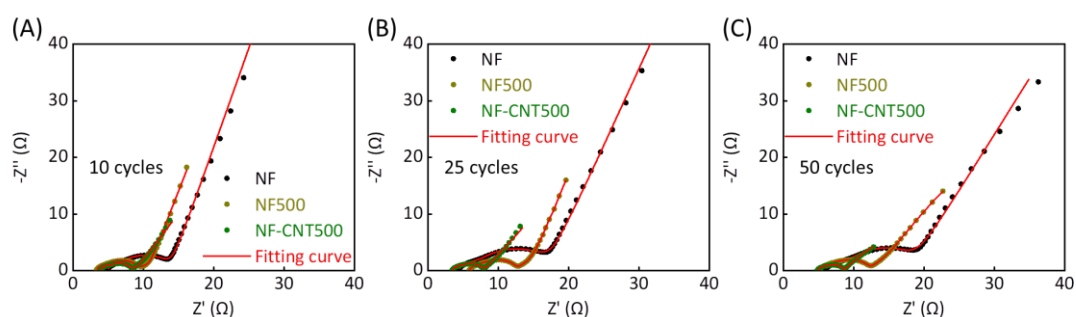
Supplementary Figure 4. Digital photos of molten Li infusion in NF-CNT500.



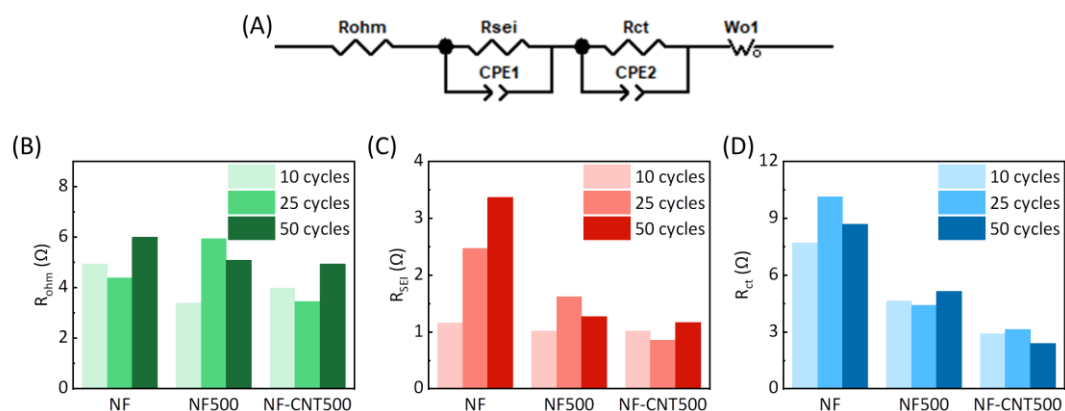
Supplementary Figure 5. (A) Ni 2p and (B) O 1s XPS spectra of initially cycled NF and NF-CNT500.



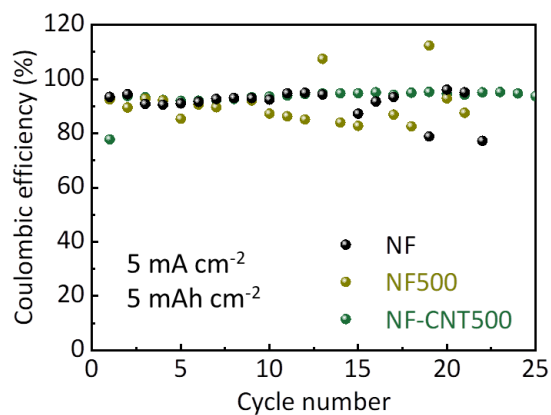
Supplementary Figure 6. EIS spectrum of Li || Ni half cells using NF, NF500 and NF-CNT500 before cycling.



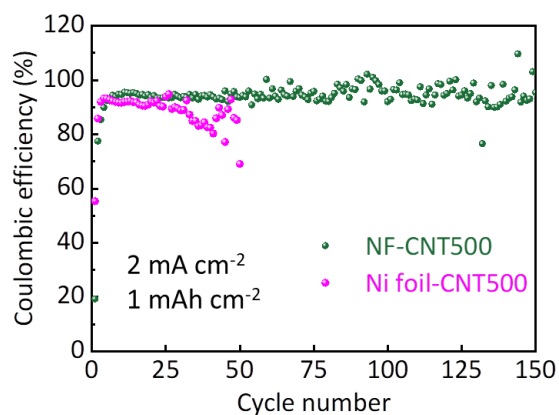
Supplementary Figure 7. EIS spectra of Li || Ni half cells using NF, NF500 and NF-CNT500 after (A) 10, (B) 25 and (C) 50 cycles at 1 mA cm^{-2} - 1 mAh cm^{-2} .



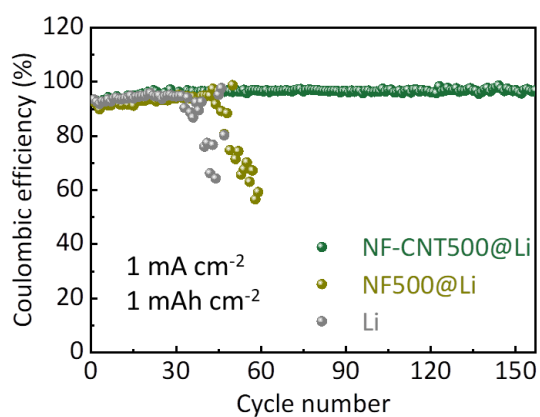
Supplementary Figure 8. (A) Equivalent circuit diagram used for EIS spectral fitting. (B) R_{ohm} , (C) R_{SEI} and (D) R_{ct} obtained by fitting the EIS spectra of Li || Ni half cells upon cycling at 1 mA cm^{-2} - 1 mAh cm^{-2} .



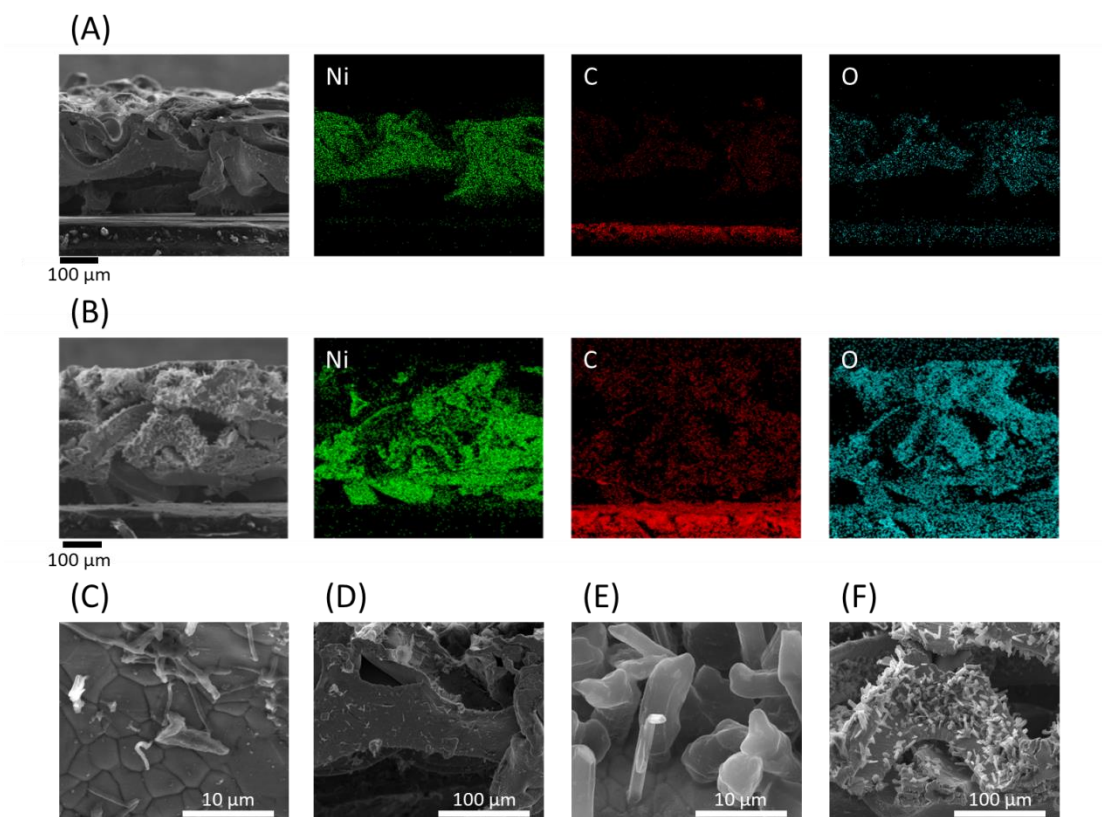
Supplementary Figure 9. Cycling CE of Li plating/stripping on the investigated hosts at 5 mA cm⁻² - 5 mAh cm⁻².



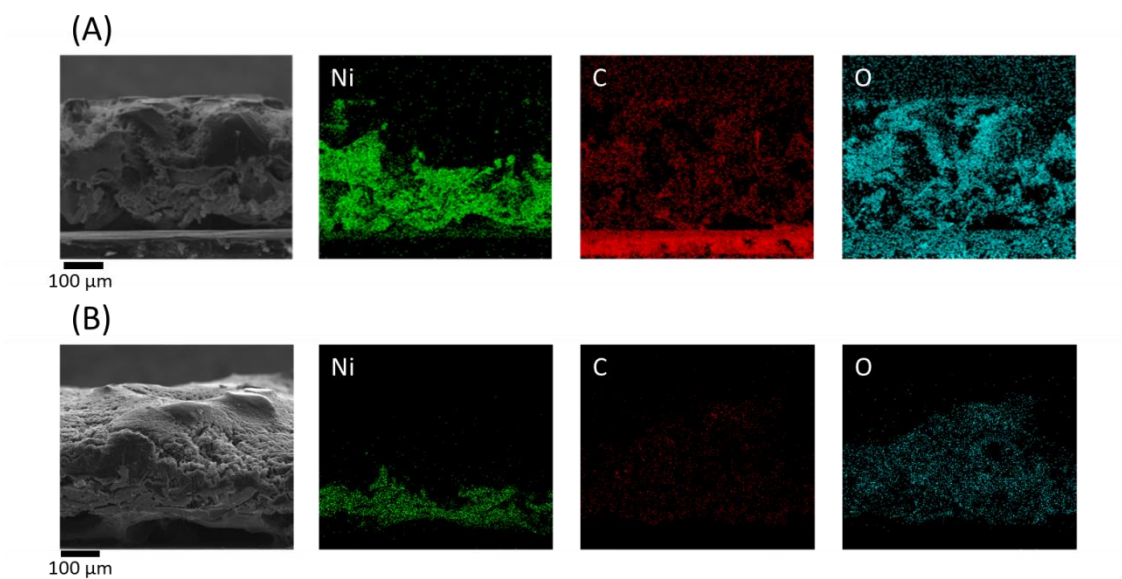
Supplementary Figure 10. Cycling CE of Li plating/stripping on NF-CNT500 and Ni foil-CNT500 at 2 mA cm⁻² - 1 mAh cm⁻².



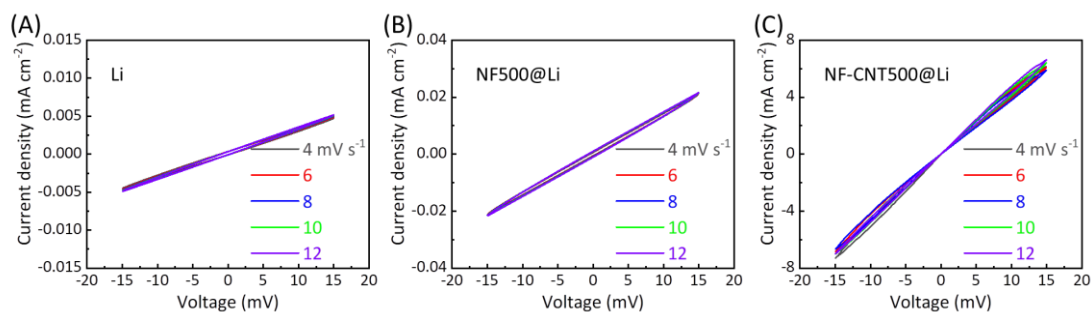
Supplementary Figure 11. Cycling CE of Li || Cu half cells using Li, NF500@Li and NF-CNT500@Li at 1 mA cm⁻² - 1 mAh cm⁻².



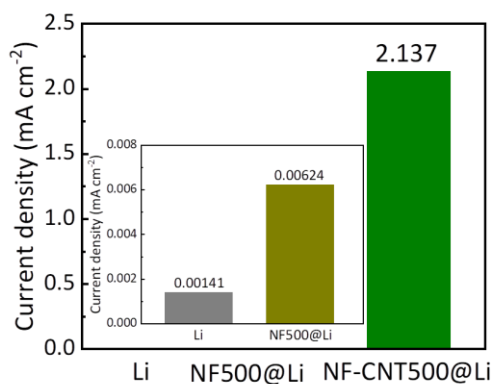
Supplementary Figure 12. Cross-section SEM and EDS images of (A) NF and (B) NF-CNT500 at a Li plating capacity of 1 mAh cm^{-2} . Amplified cross-section SEM images of (C, D) NF and (E, F) NF-CNT500 at a Li plating capacity of 1 mAh cm^{-2} .



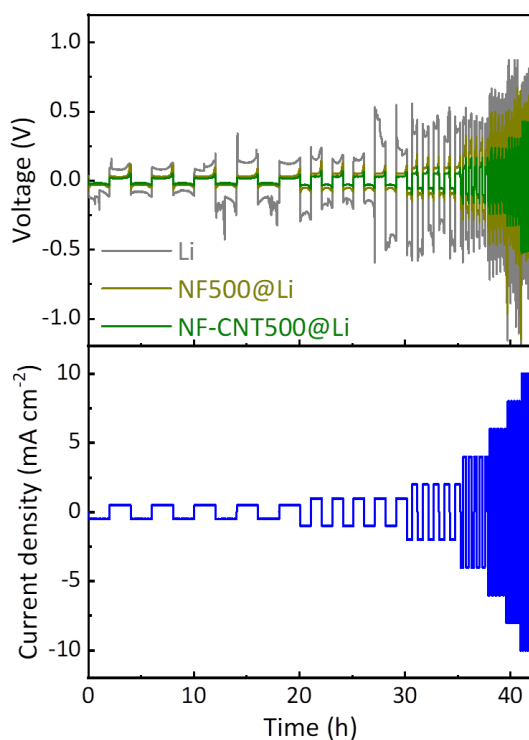
Supplementary Figure 13. Cross-section SEM and EDS images of (A) NF and (B) NF-CNT500 at a Li plating capacity of 4 mAh cm^{-2} .



Supplementary Figure 14. CV curves of symmetrical cells using (A) Li, (B) NF500@Li and (C) NF-CNT500@Li electrodes, recorded in the voltage window of ± 15 mV at different scanning rates.



Supplementary Figure 15. Exchange current density of the investigated symmetrical cells.



Supplementary Figure 16. Voltage profile of symmetrical cells during rate ability test.