

Supporting Information

Confinement effect and air tolerance of Li plating by lithiophilic poly(vinyl alcohol) coating for dendrite-free Li metal batteries

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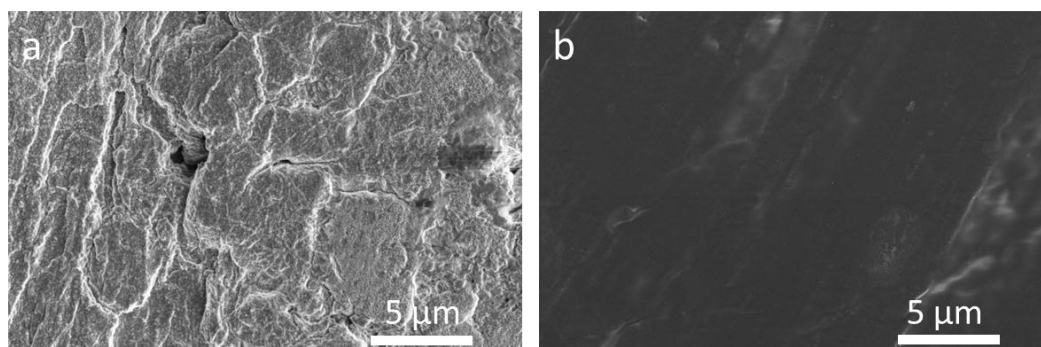


Figure S1. Surface SEM morphologies of (a) pristine Li and (b) PVA-Li after 10 cycles at 1 mA cm^{-2} with an areal capacity of 1 mAh cm^{-2} .

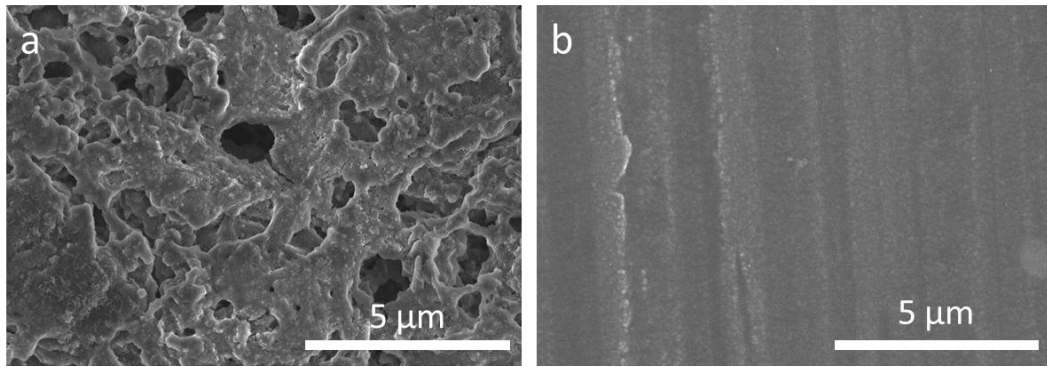


Figure S2. Surface SEM morphologies of (a) pristine Li and (b) PVA-Li after 10 cycles at 5 mA cm^{-2} with an areal capacity of 1 mAh cm^{-2} .

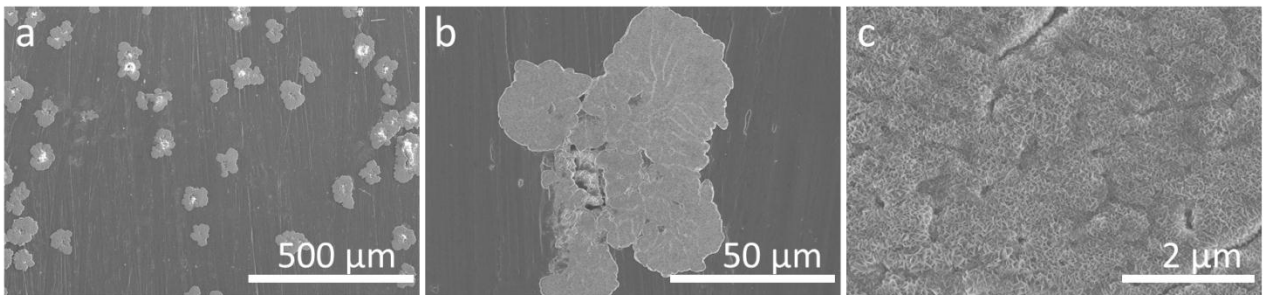


Figure S3. Surface SEM morphologies of PVA-Li with broken surface and large hole in (a) overview, (b) low magnification and (c) high magnification after 10 cycles at 5 mA cm^{-2} with an areal capacity of 1 mAh cm^{-2} .

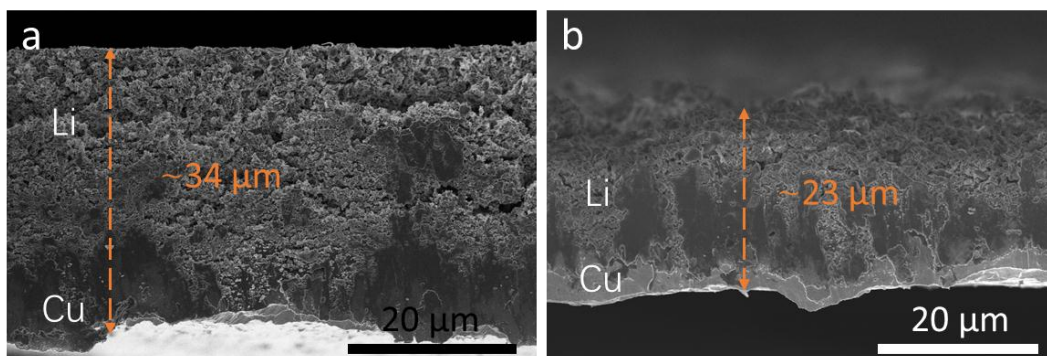


Figure S4. Cross-section SEM morphologies of Li deposited on (a) pristine Cu

and (b) PVA-Cu electrodes after 30 cycles at a high current density of 5 mA cm⁻². The thickness of Cu foil is about 10 μm.

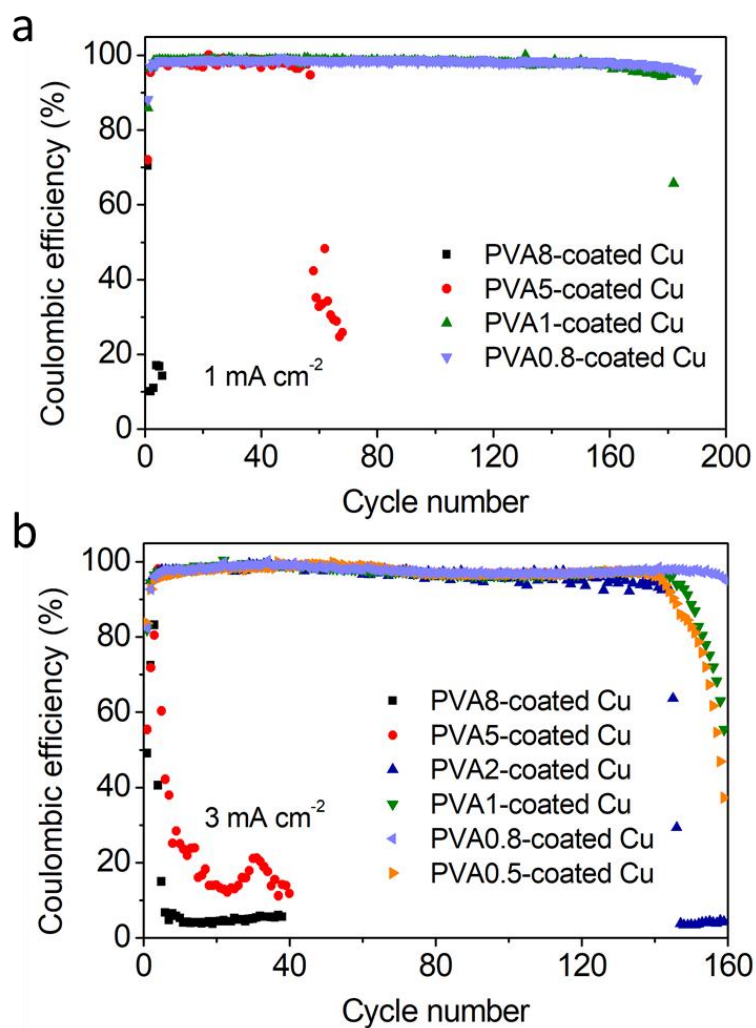


Figure S5. Comparison of CEs of Li/Cu cells based on PVA-coated Cu electrodes of different PVA thickness at current densities of (a) 1 mA cm⁻² and (b) 3 mA cm⁻² with a fixed capacity of 1 mAh cm⁻².

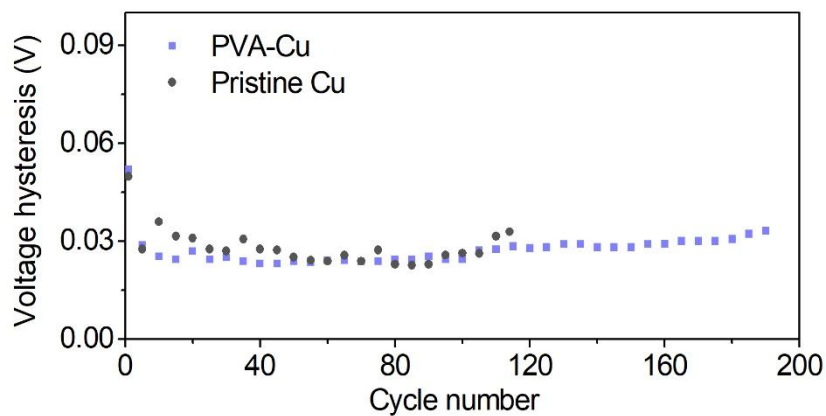


Figure S6. Voltage hysteresis comparison of Li/Cu cells during Li plating/stripping at a current density of 1 mA cm^{-2} with a capacity of 2 mAh cm^{-2} .

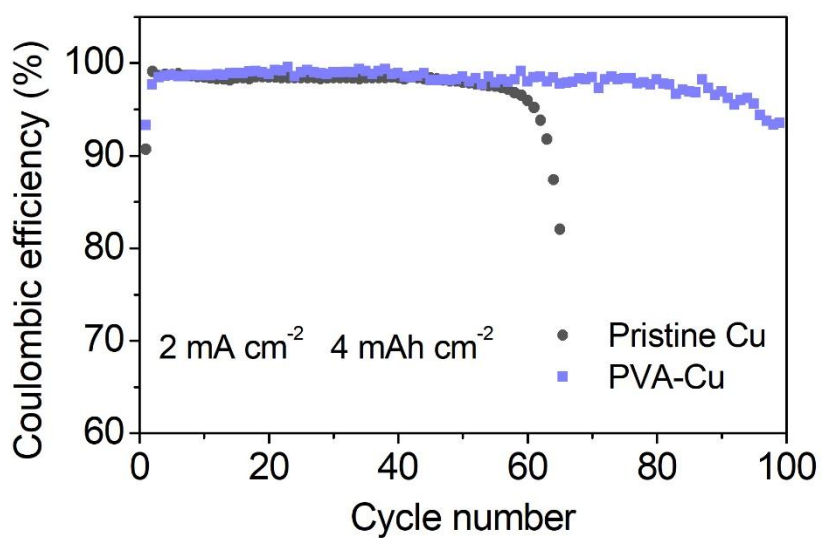


Figure S7. CEs of Li/Cu cells based on pristine Cu and PVA-Cu electrodes with a high areal capacity of 4 mAh cm^{-2} at 2 mA cm^{-2} .

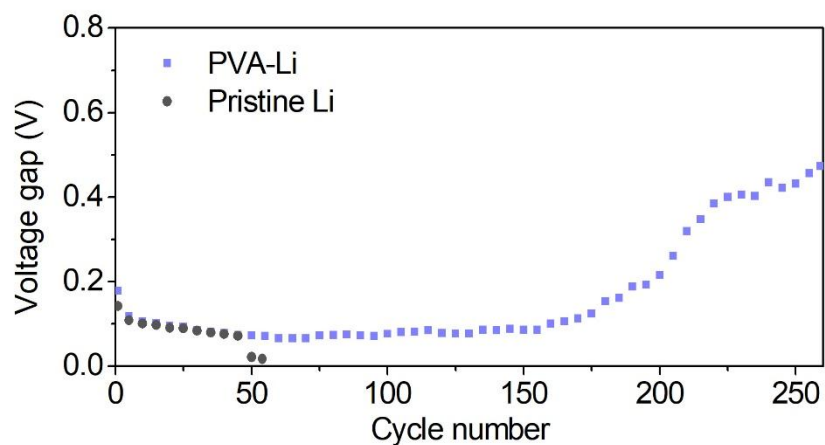


Figure S8. Voltage gap comparison of Li/Li symmetric cells during Li plating/stripping at a high current density of 5 mA cm^{-2} with 2 mAh cm^{-2} .

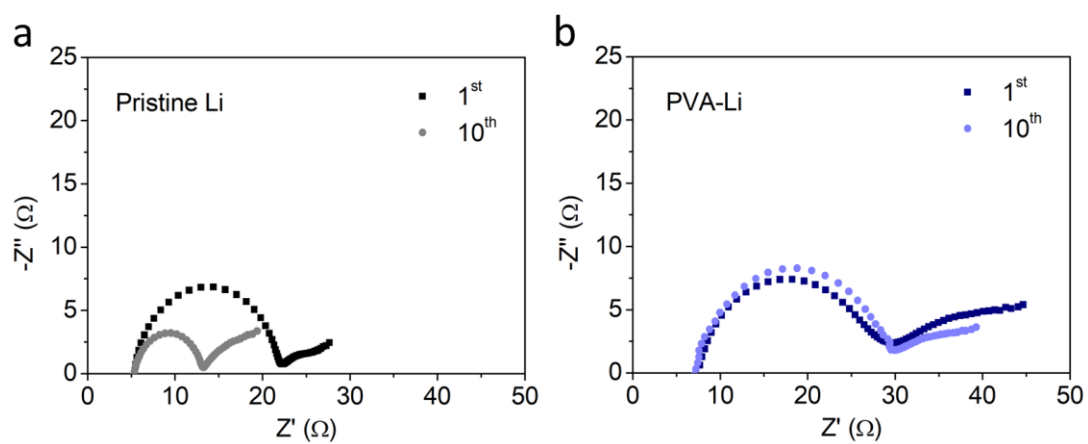


Figure S9. Electrochemical impedance spectra of Li/Li cells based on (a) pristine Li and (b) PVA-Li electrodes after the 1st and 10th cycles at a current density of 2 mA cm^{-2} .

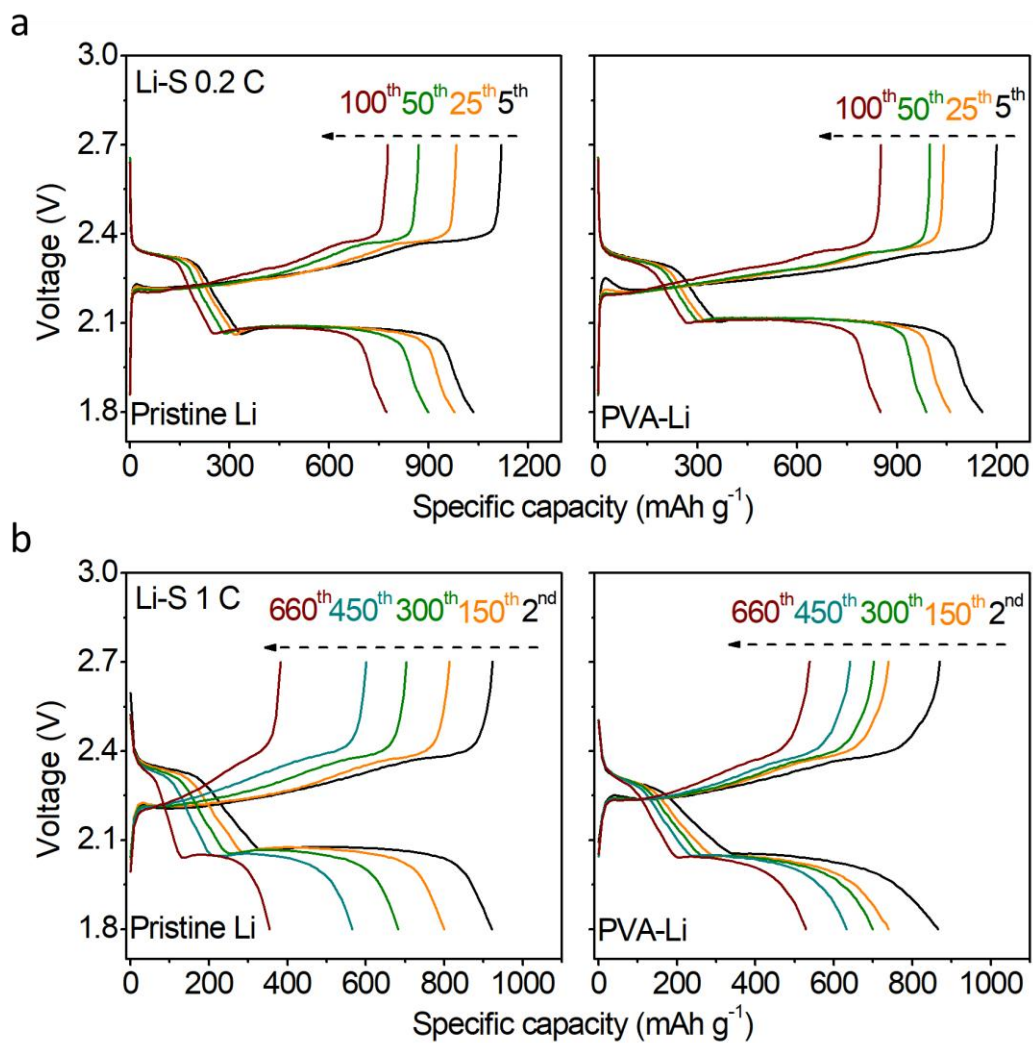


Figure S10. Charge and discharge profiles of Li-S cells based on pristine Li or PVA-Li anodes at different cycling stages at (a) 0.2 C and (b) 1 C.