Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Electronic Supplementary Information

Electrochemical Flow-based Solution-Solid Growth of Cu_2O Nanorods Array: Potential Application to Lithium Ion Batteries

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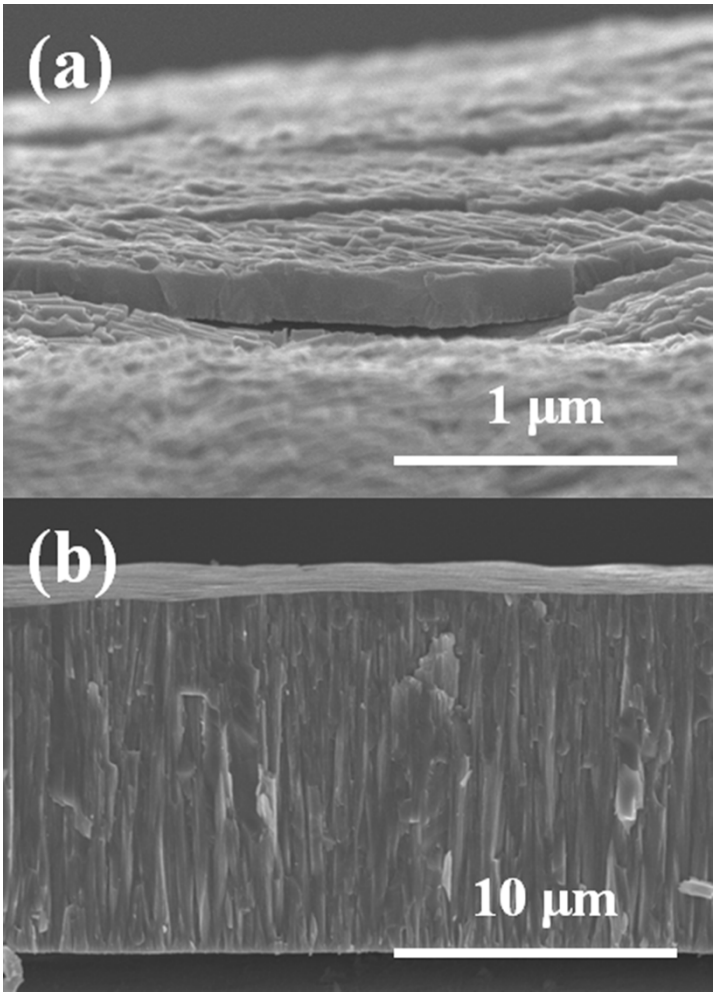

Figure S1. Cross-sectional SEM images of (a) 200 nm-thick Cu_2O films and (b) 10 μm-thick Cu_2O films.

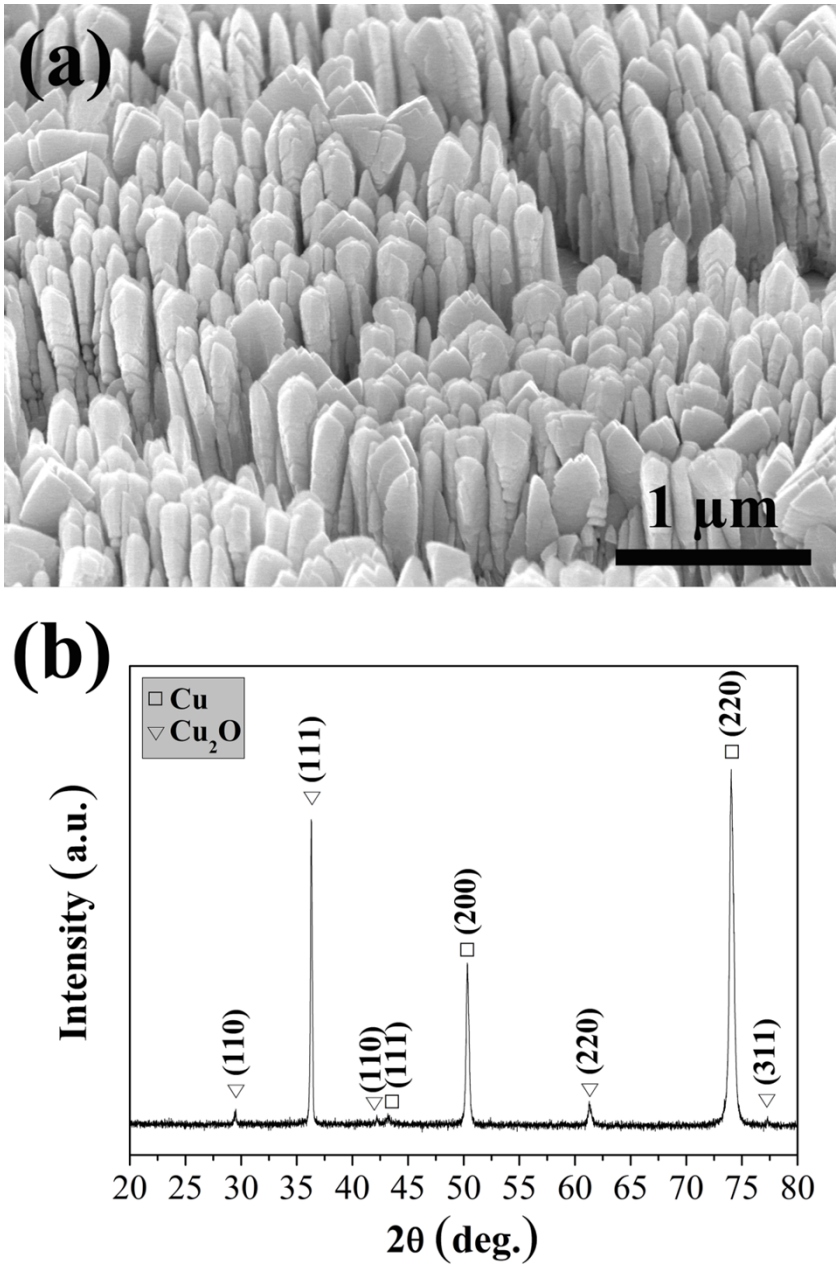

Figure S2. (a) Tilted SEM image and (b) XRD pattern of Cu_2O NRs electrodeposited on Cu foil for 4 hours.

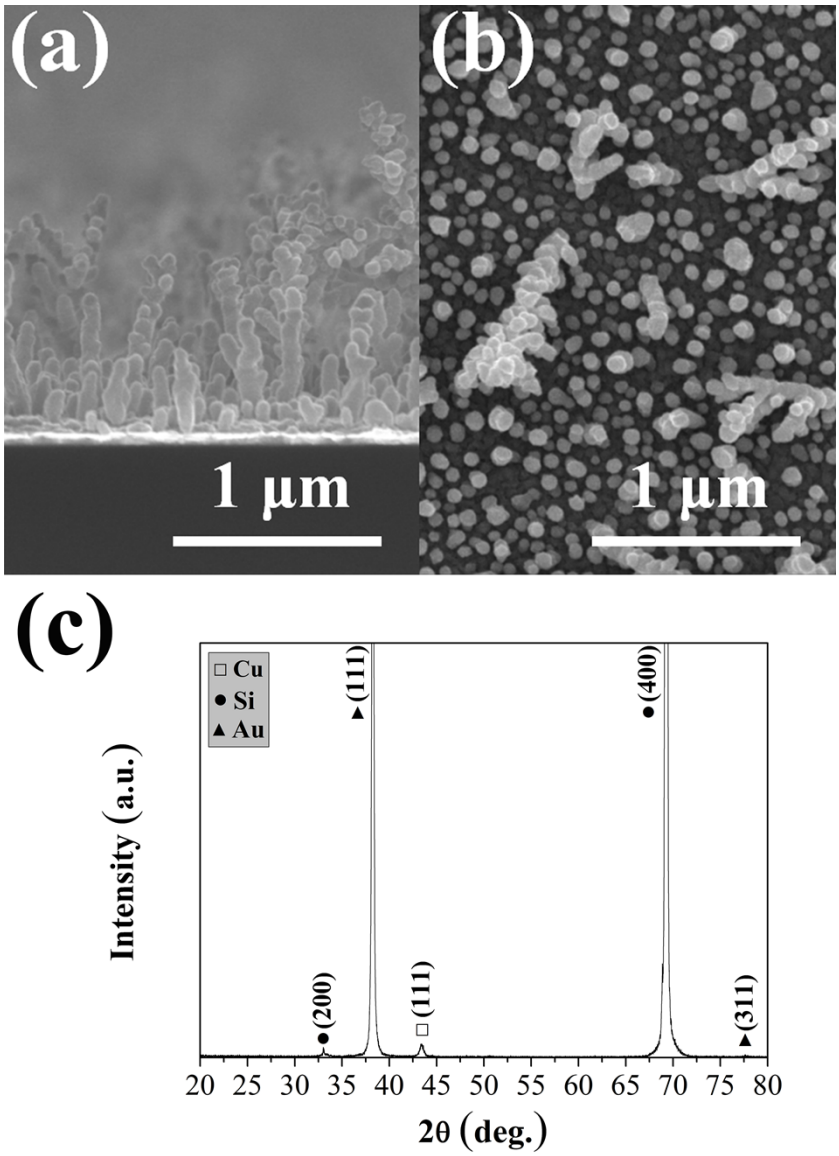

Figure S3. (a) Cross-sectional and (b) top-view SEM images, and (C) XRD pattern of Cu NRs electrodeposited in a glove box filled with N_2 gas (electrodeposition condition; 50 μM $CuSO_4 \cdot H_2O$, pH of 5.6, V_R of -14 V, V_O of 0.5 V, frequency of 0.5 Hz, and duty of 50 %).

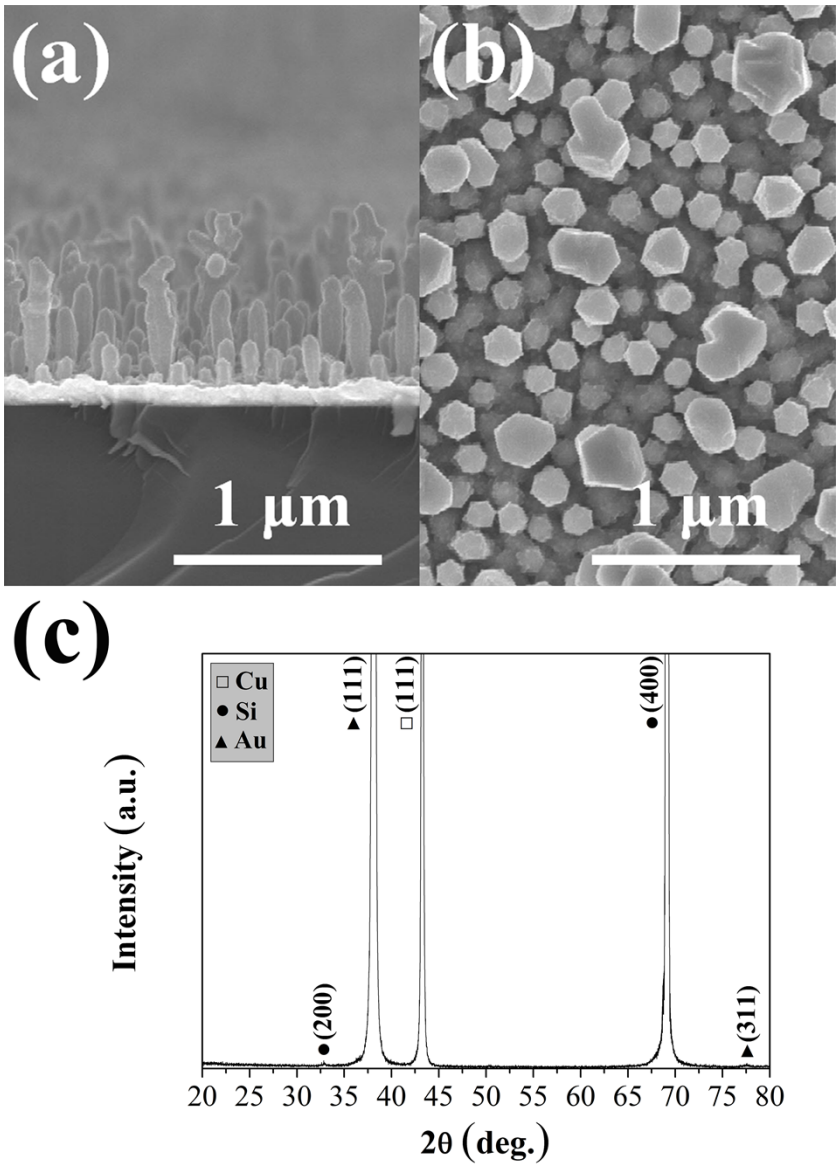

Figure S4. (a) Cross-sectional and (b) top-view SEM images, and (c) XRD pattern of Cu NRs electrodeposited at the pH of 3.8 in an ambient atmosphere (electrodeposition condition; 50 μM $CuSO_4 \cdot H_2O$, 100 μM H_2SO_4, V_R of -14 V, V_O of 0.5 V, frequency of 0.5 Hz, and duty of 50 %).

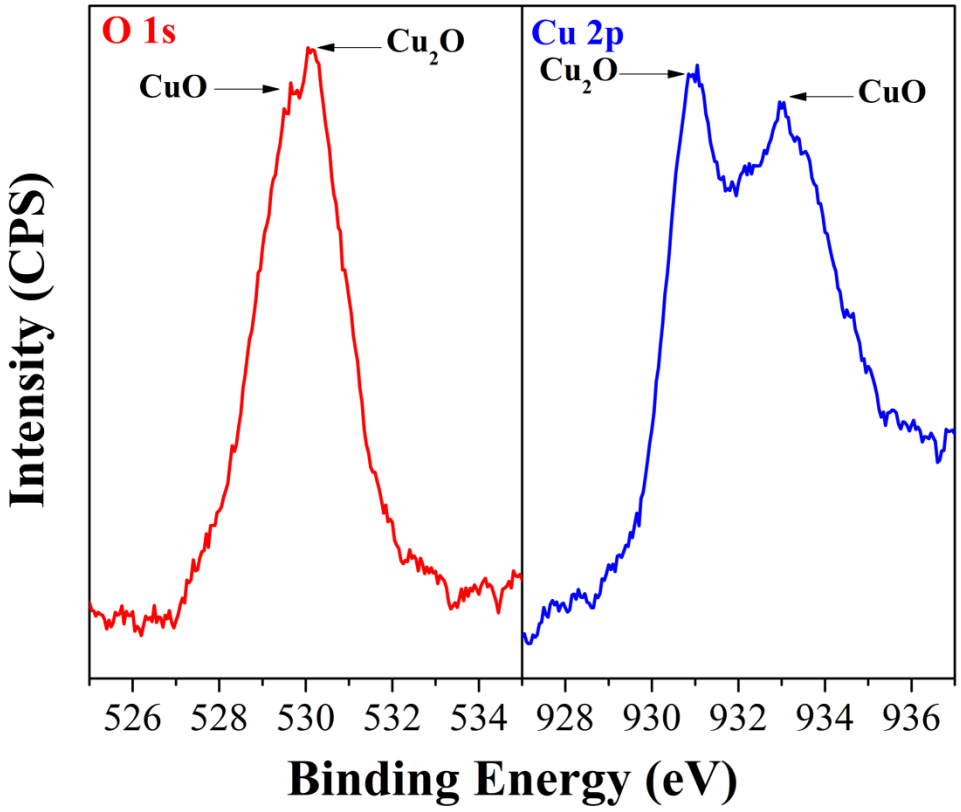

Figure S5. XPS results of Cu_2O NRs which was electrodeposited for 4 hours.

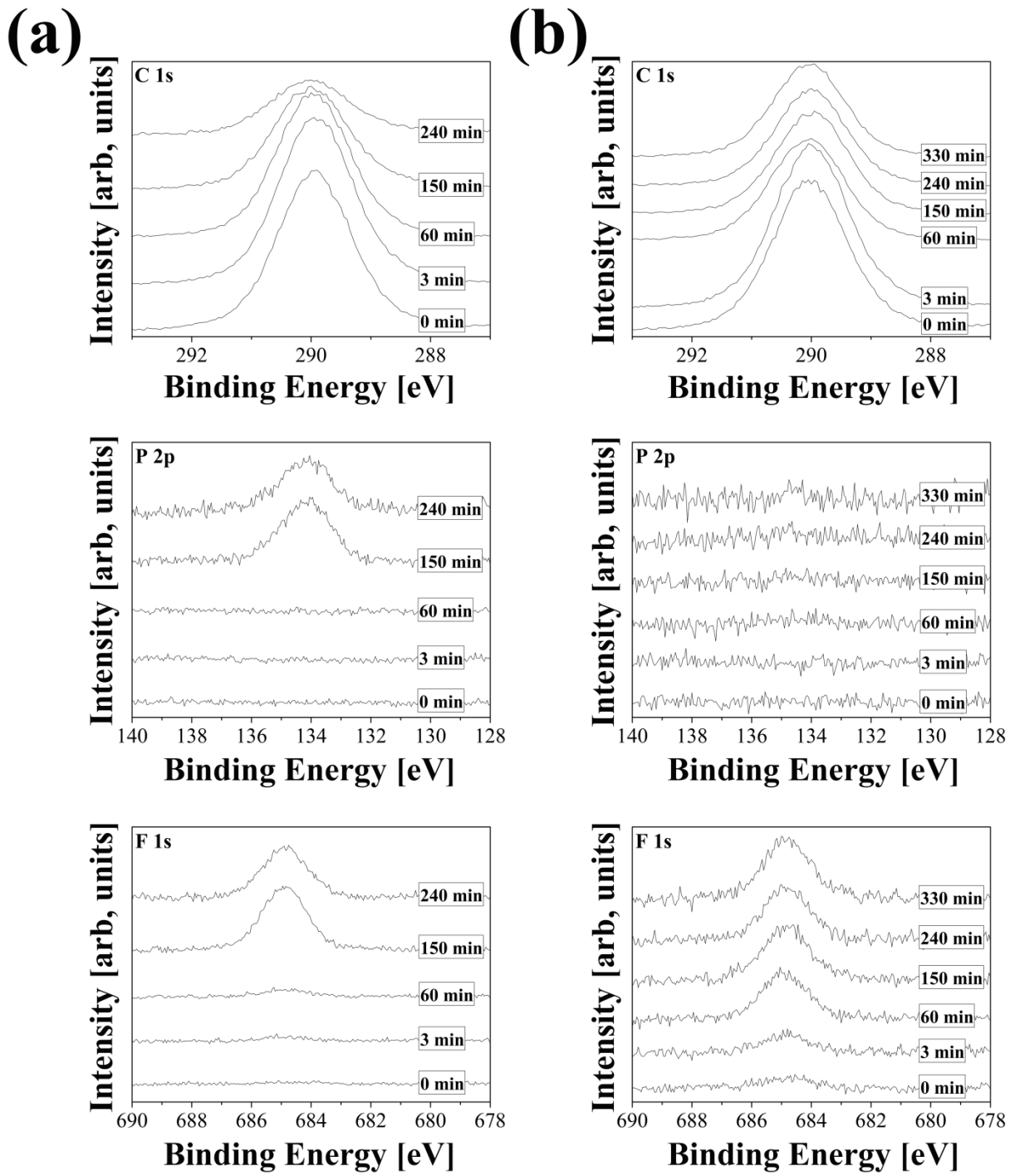

Figure S6. XPS results of C1s, P2p and F1s emission lines according to the ion milling times: (a) 200th discharge, (b) 200th charge. C1s, P2p and F1s correspond to Li_2CO_3, Li_3PO_4, and LiF, respectively. The results show that the formation and decomposition of LiF are irreversible while those of Li_3PO_4 are reversible. Some Li_2CO_3 are irreversibly formed on the top surface of the NRs.