

Supporting Information

Hollow titanium oxynitride nanorod array for electrode substrate prepared by hot NH₃-induced Kirkendall effect

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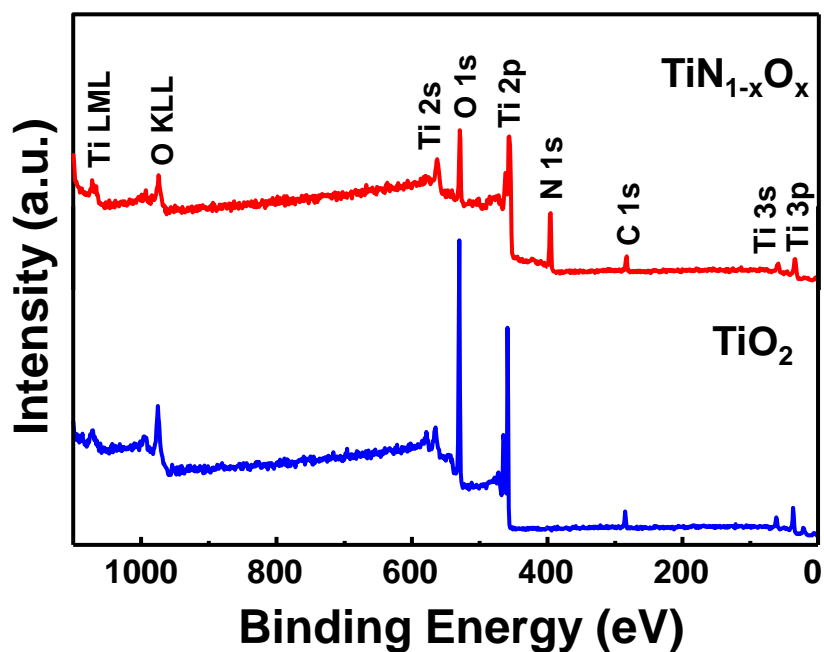


Fig. S1 XPS survey spectra of $\text{TiN}_{1-x}\text{O}_x$ and TiO_2 .

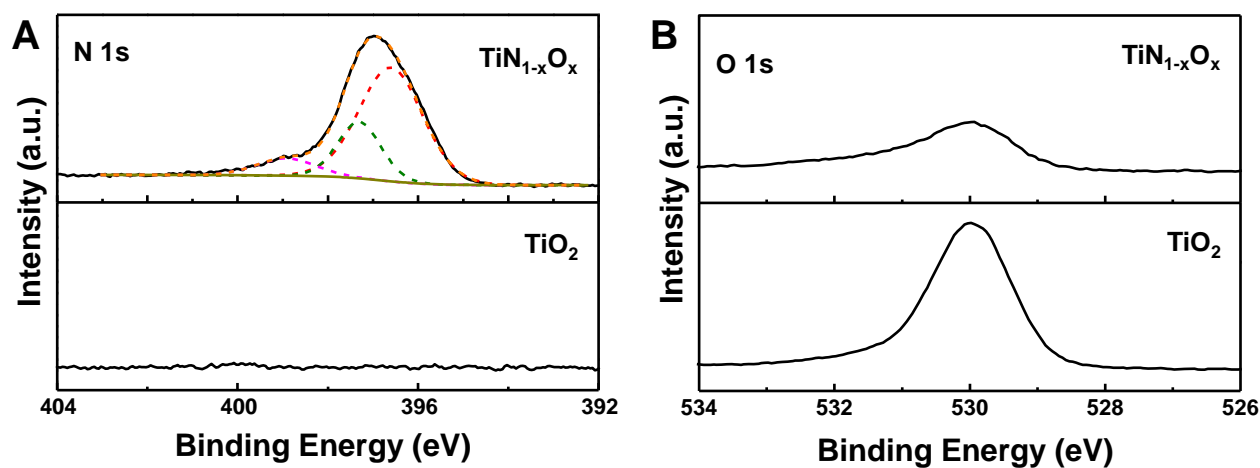


Fig. S2 XPS spectra of (A) N1s (solid black line: original data, dotted orange line: fitted data, solid dark yellow line: background, dotted orange line: nitridic N, dotted green line: oxynitridic N, and dotted pink line: chemisorbed atomic N-like species) and (B) O 1s from $\text{TiN}_{1-x}\text{O}_x$ and TiO_2 .

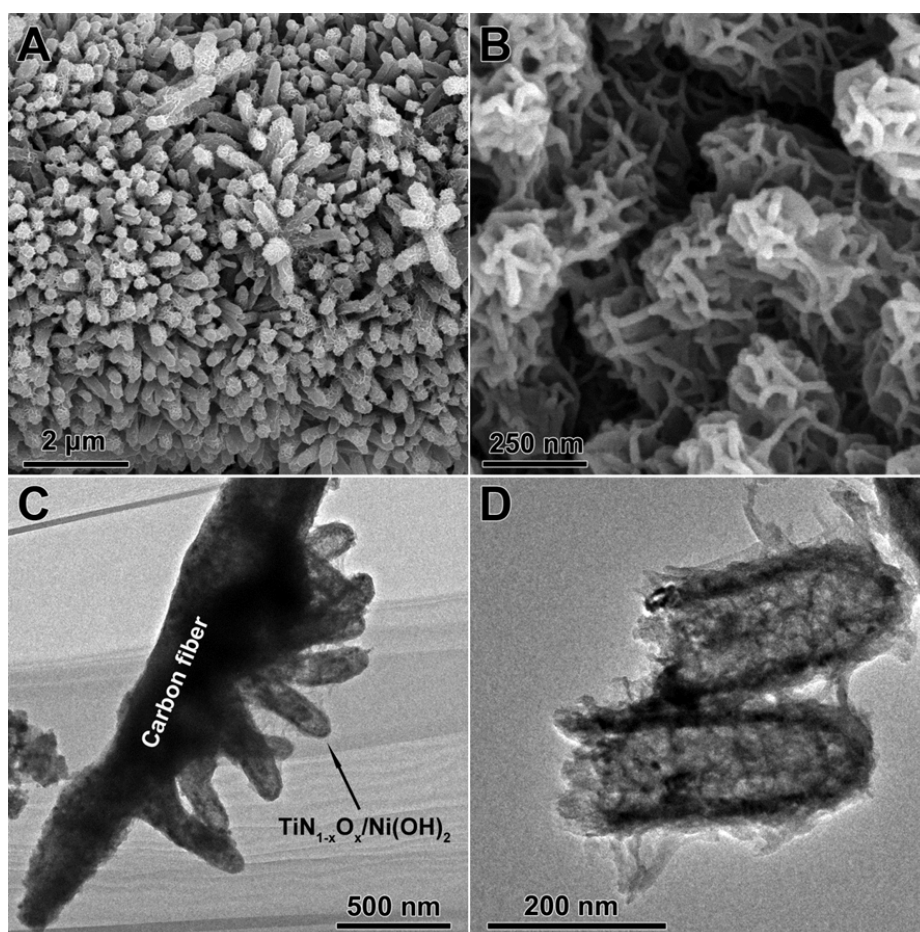


Fig. S3 SEM and TEM images of CFP/TiN_{1-x}O_x/Ni(OH)₂ electrode.

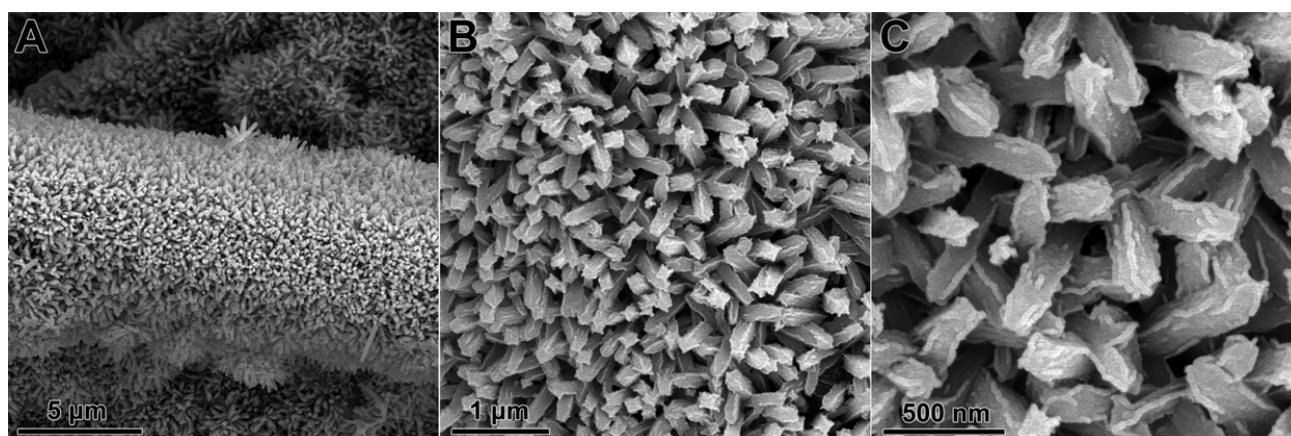


Fig. S4 SEM images of CFP/TiO₂/Ni(OH)₂ electrode.

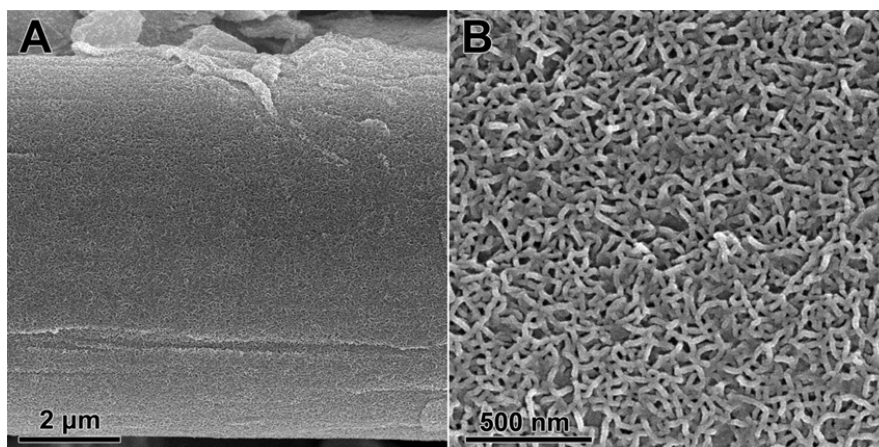


Fig. S5 SEM images of CFP/Ni(OH)₂ electrode.

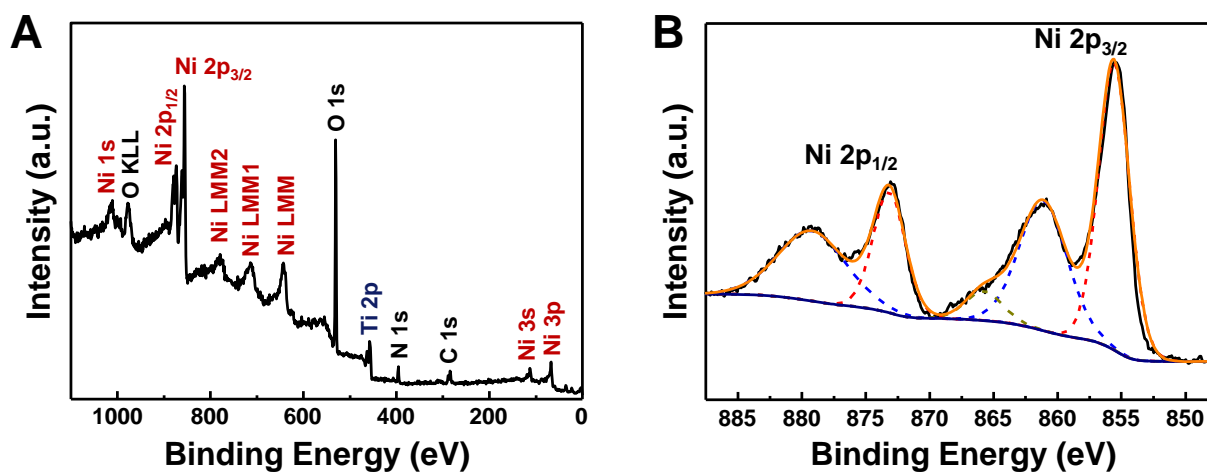


Fig. S6 (A) XPS survey spectra of CFP/TiN_{1-x}O_x/Ni(OH)₂ electrode and (B) XPS spectra of Ni 2p.

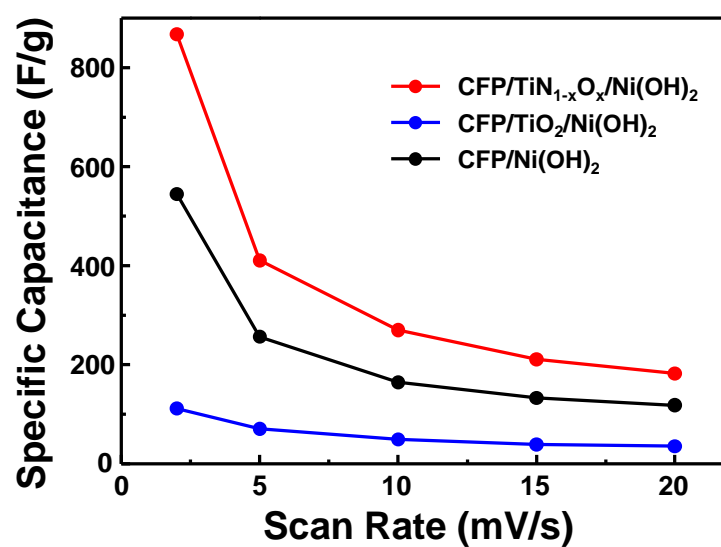


Fig. S7 Gravimetric capacitance of CFP/TiN_{1-x}O_x/Ni(OH)₂, CFP/TiO₂/Ni(OH)₂, and CFP/Ni(OH)₂ electrodes at various scan rates. Note that only the weight of CFP was excluded from the total mass of active materials.

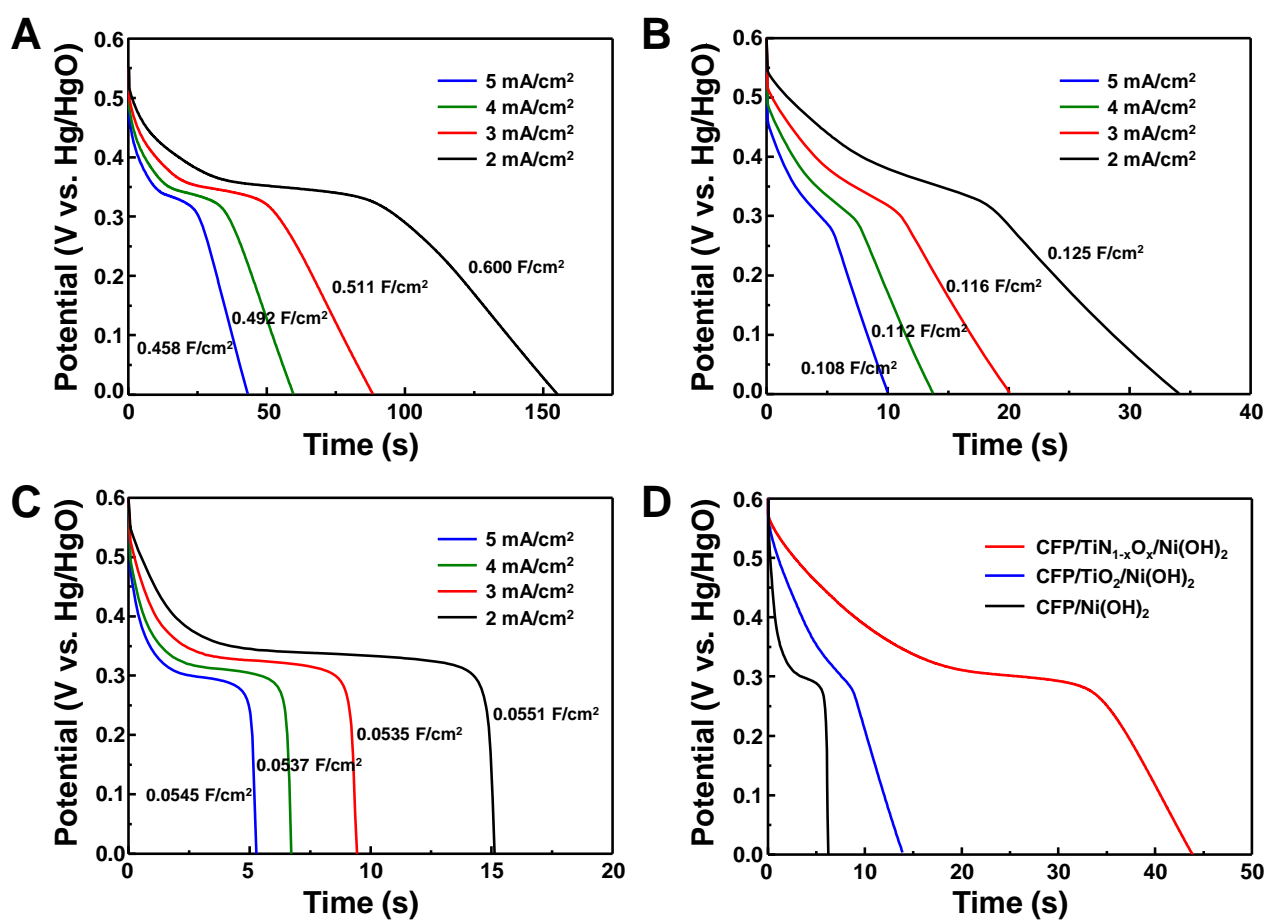


Fig. S8 Galvanostatic discharge curves of (a) CFP/TiN_{1-x}O_x/Ni(OH)₂, (b) CFP/TiO₂/Ni(OH)₂, and (c) CFP/Ni(OH)₂ electrodes at various current densities; (d) comparison of the galvanostatic discharge curves of CFP/TiN_{1-x}O_x/Ni(OH)₂, CFP/TiO₂/Ni(OH)₂, and CFP/Ni(OH)₂ electrodes obtained at 5 mA/cm².

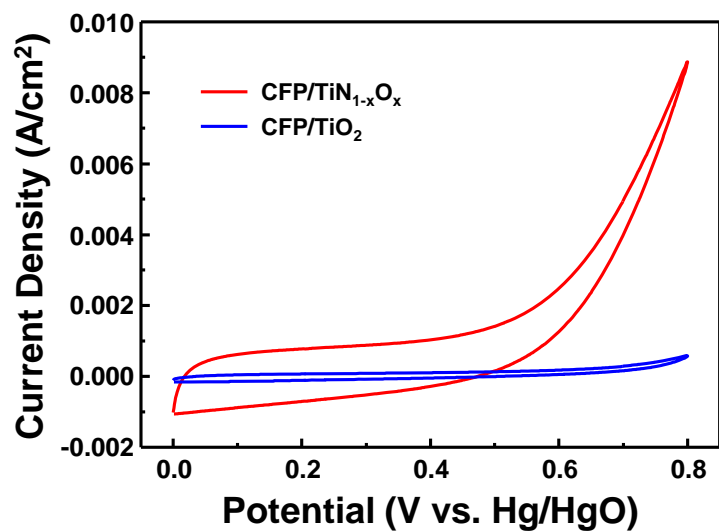


Fig. S9 Cyclic voltamograms of CFP/TiN_{1-x}O_x and CFP/TiO₂ electrodes at a scan rate of 10 mV/s in 1 M KOH electrolyte.

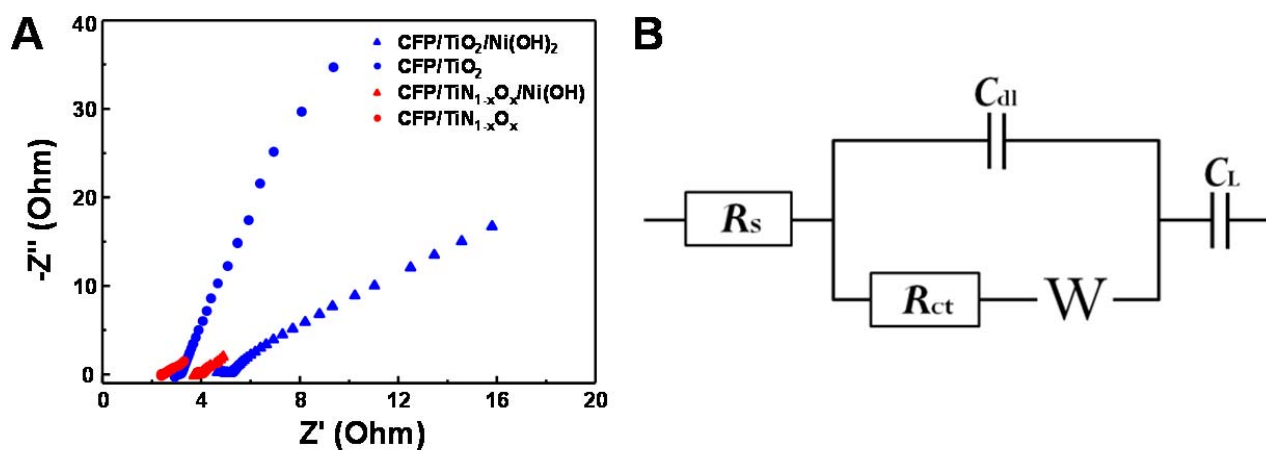


Fig. S10 (A) EIS of CFP/TiN_{1-x}O_x/Ni(OH)₂, CFP/TiN_{1-x}O_x, CFP/TiO₂/Ni(OH)₂, CFP/TiO₂ electrodes and (B) an equivalent circuit employed to fit the EIS spectra (R_s : ohmic serial resistance, R_{ct} : charge-transfer resistance, W : Warburg impedance, C_{dl} : double-layer capacitor, and C_L : limit capacitor)

Table S1. Equivalent circuit parameters fitted from Nyquist plots

	R_s (Ω)	R_{ct} (Ω)	W (Ω)	C_{dl} (F)	C_L (F)
CFP/TiN _{1-x} O _x /Ni(OH) ₂	3.78	0.134	1.7	3.33×10^{-4}	0.122
CFP/TiO ₂ /Ni(OH) ₂	4.49	0.515	11.1	5.35×10^{-6}	7.46×10^{-3}

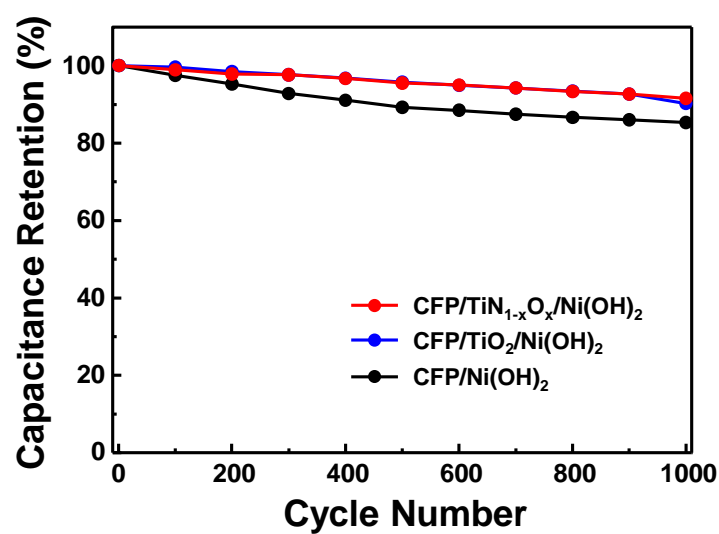


Fig. S11 Long-term cycling performance of CFP/TiN_{1-x}O_x/Ni(OH)₂, CFP/TiO₂/Ni(OH)₂, and CFP/Ni(OH)₂ electrodes implemented at 100 mV/s.