Supporting Information for

All-Covalent Organic Frameworks Nanofilms Assembled Lithium-Ion Capacitor to Solve the Imbalanced Charge Storage Kinetics

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Supplementary Figures and Tables

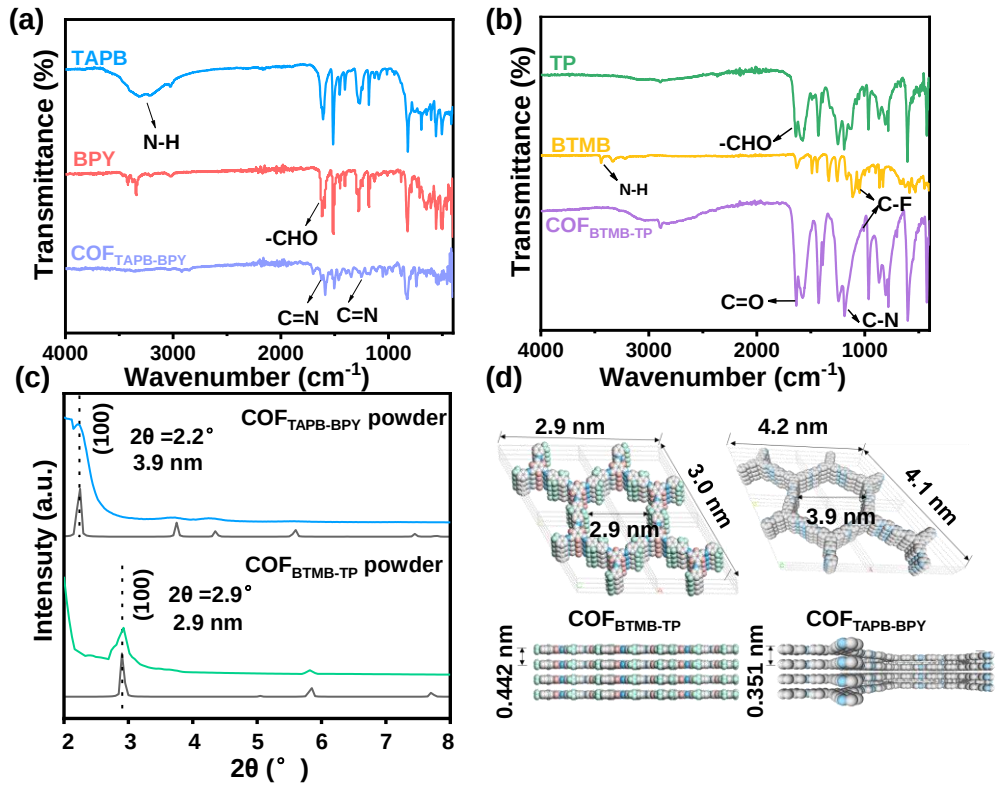

Fig. S1. FT-IR spectra (**a-b**), XRD (**c**) and MS calculation result (**d**) of $COF_{TAPB-BPY}$

and $COF_{BTMB-TP}$

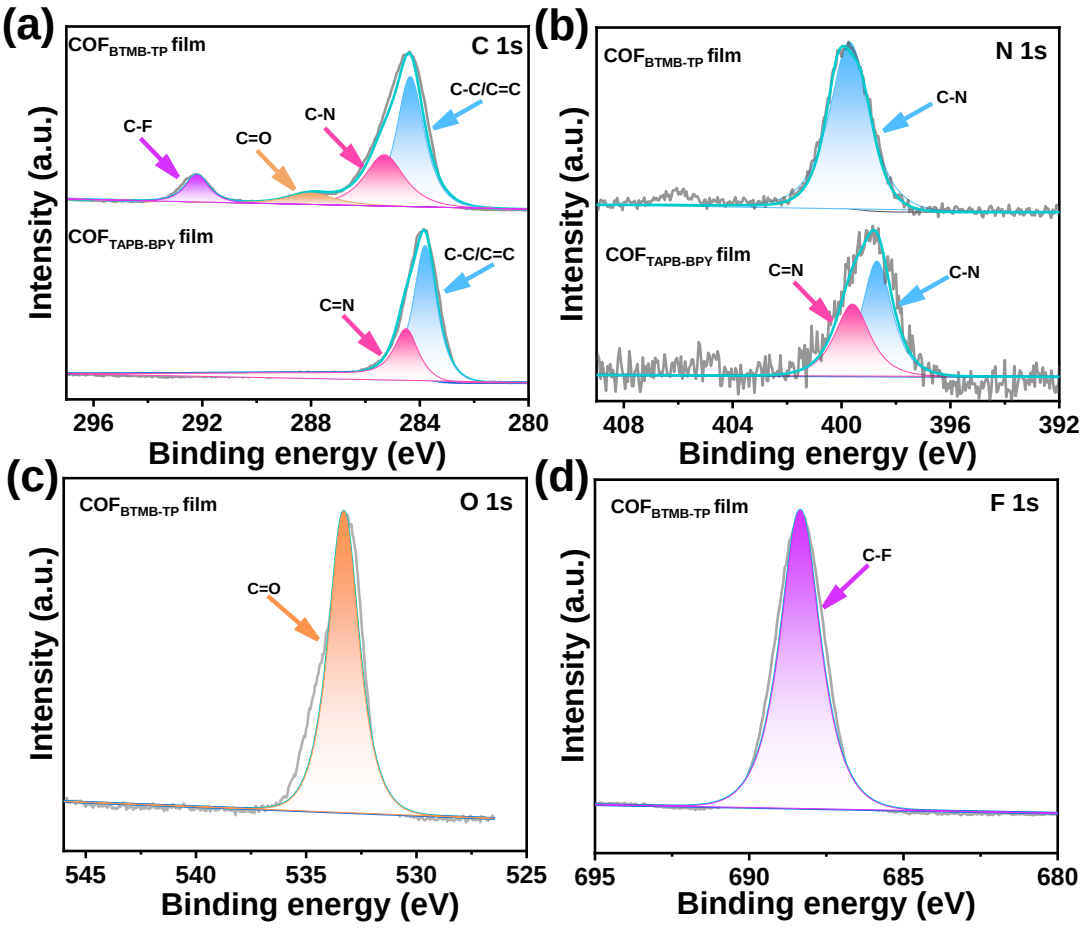

Fig. S2 C 1s (**a**), and N 1s (**b**) core-level spectra of $COF_{TAPB-BPY}$ and $COF_{BTMB-TP}$ film; O 1s (**c**), and F 1s (**d**) of $COF_{BTMB-TP}$ film

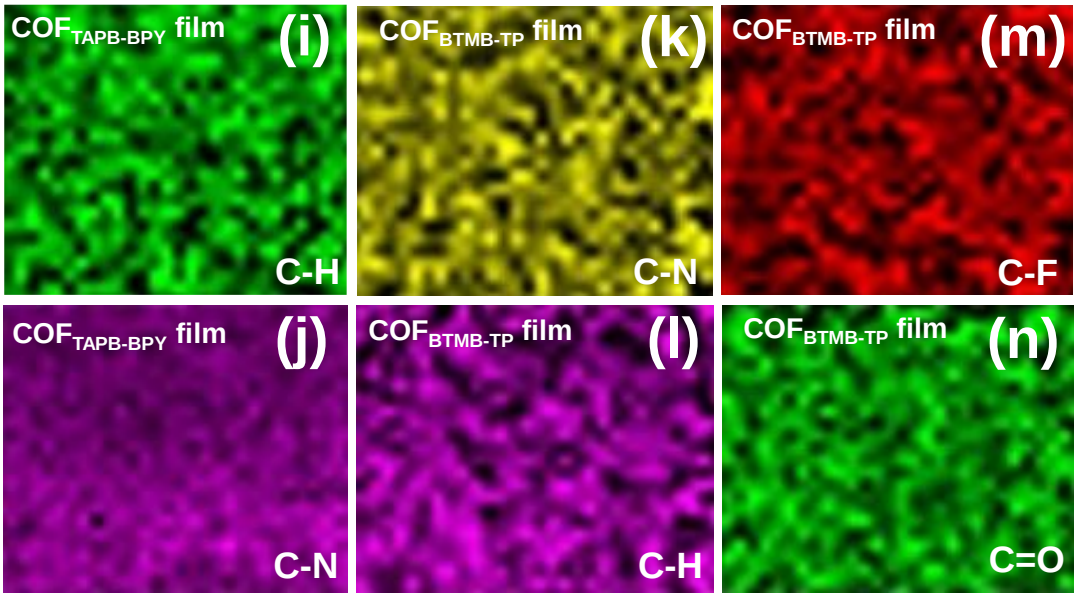

Fig. S3 Raman mapping (a-f) of $COF_{TAPB-BPY}$ and $COF_{BTMB-TP}$ nanofilms

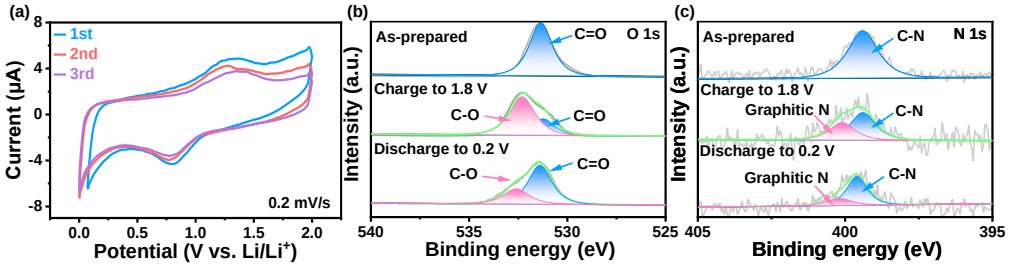

Fig. S4 CV curves at 0.2 mV/s in the first 3 cycles; Ex-situ XPS spectra of in $LiClO_4$ (1 M, in EC:PC=1:1 Vol%) alternative electrolyte

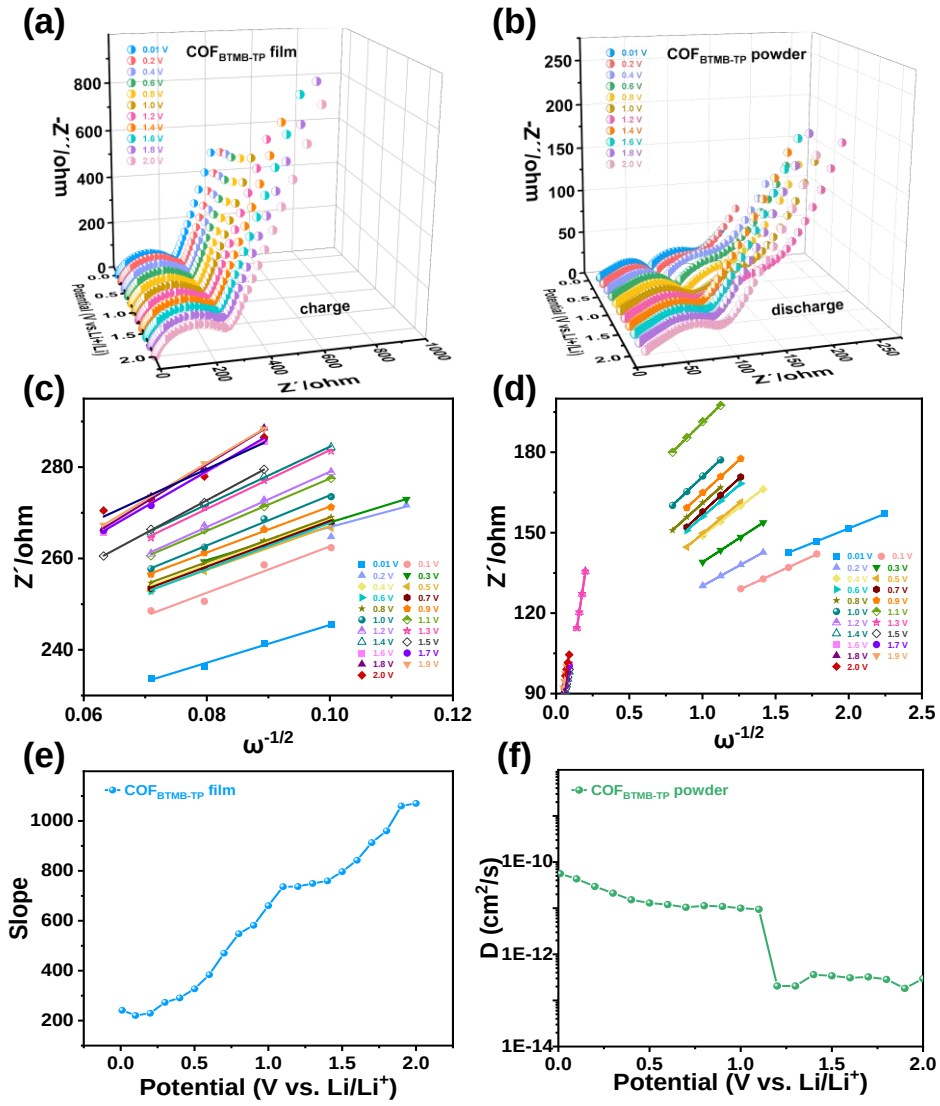

Fig. S5 Nyquist plots of $COF_{BTMB-TP}$ nanofilms at various potential during charge processes (**a**) and $COF_{BTMB-TP}$ powder during discharge processes (**b**), Z' as a function of the $\omega^{1/2}$ plot in the low frequency range of $COF_{BTMB-TP}$ nanofilms charged (**c**) and $COF_{BTMB-TP}$ powder discharged (**d**) (the slope of fitting curves is the Warburg factor,

σ_w), the slope values of $COF_{BTMB\text{-}TP}$ nanofilms discharged (**e**) and $COF_{BTMB\text{-}TP}$ powder discharged (**f**) at different potentials

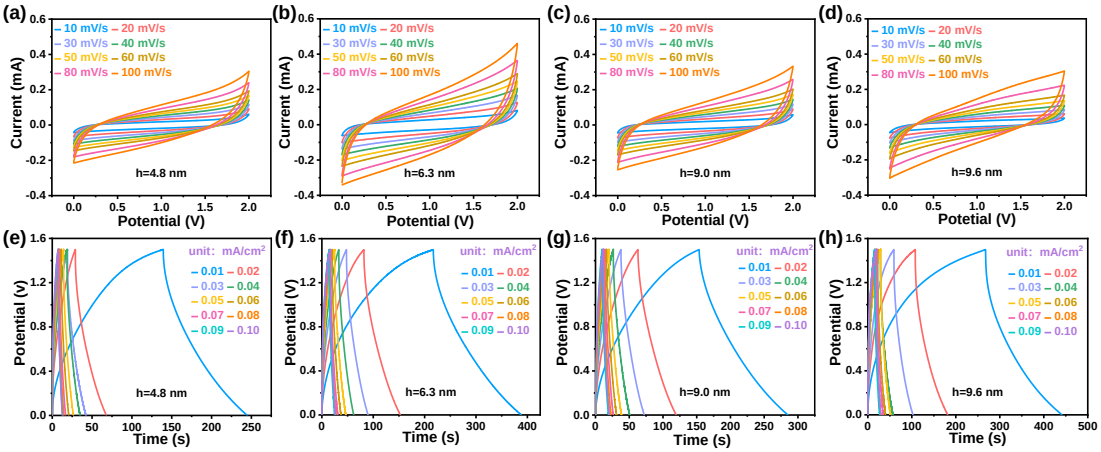

Fig. S6 CV (a-d) and GCD (e-h) curves of $COF_{TAPB\text{-}BPY}$ (*h*)//$COF_{BTMB\text{-}TP}$ LIC devices (*h* is the thickness of $COF_{TAPB\text{-}BPY}$ nanofilms, *h* = 4.8, 6.3, 9.0, and 9.6 nm)