3D N-$Ti_3C_2T_x$/Co/N-CNT Composites as a Sodiophilic Framework for Dendrite-Free Sodium Metal Anodes

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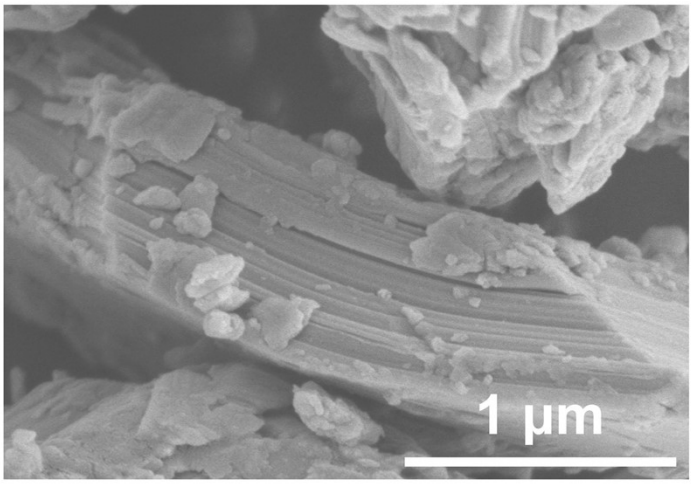

Fig. S1 SEM image of Ti_3AlC_2.

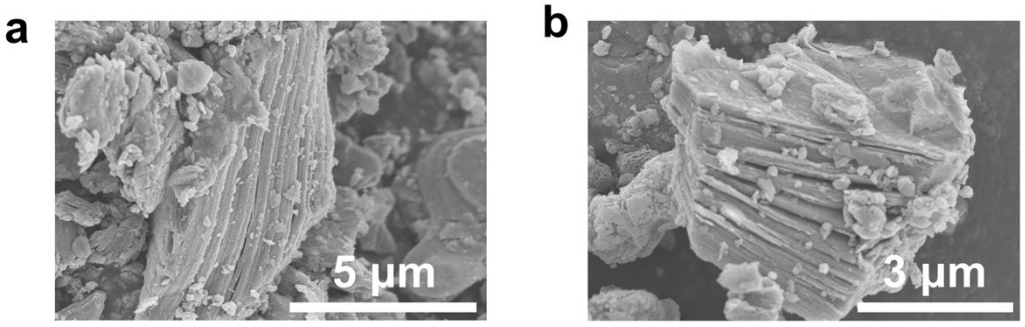

Fig. S2 (a-b) SEM images of $Ti_3C_2T_x$/Co hybrids.

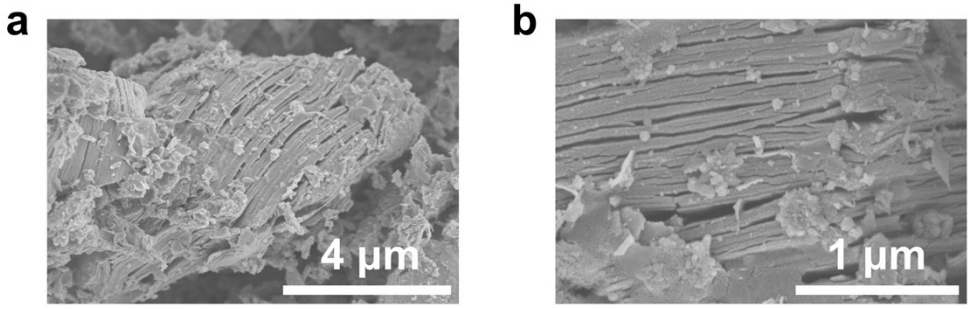

Fig. S3 (a-b) SEM images of $Ti_3C_2T_x$/Fe hybrids.

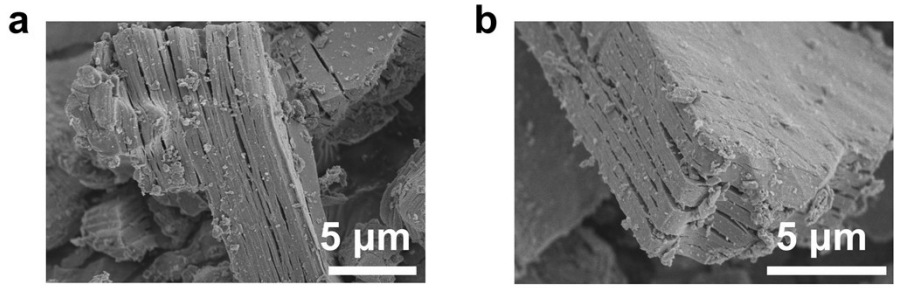

Fig. S4 (a-b) SEM images of $Ti_3C_2T_x$/Ni hybrids.

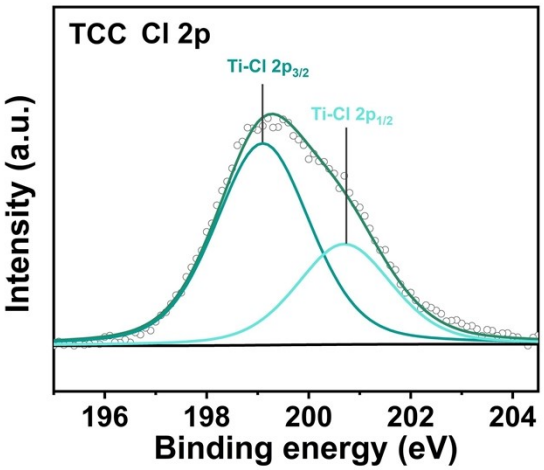

Fig. S5 Cl 2p XPS spectra of TCC composites.

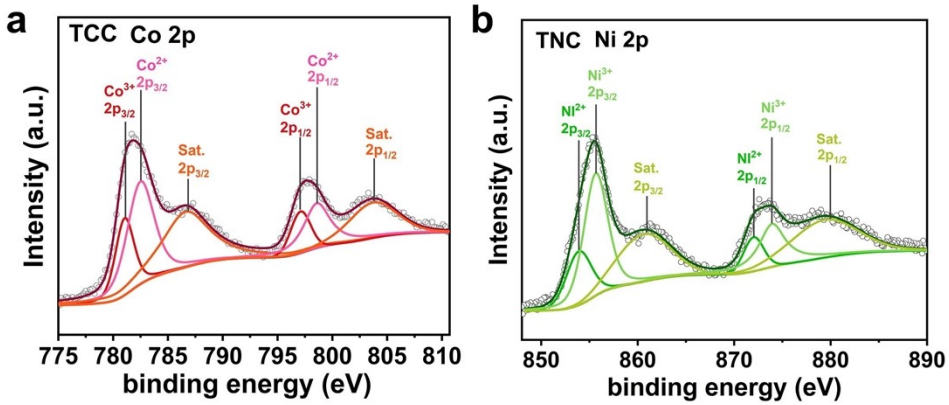

Fig. S6 (a) Co 2p XPS spectra of TCC. (b) Ni 2p XPS spectra of TNC.

The Co 2p spectrum exhibits three sets of peaks including Co^{3+} (781.1/797.2 eV), Co^{2+} (782.6/798.7 eV) and satellite peaks (786.8/804.0 eV)(**Fig. S6a**).[1] The Ni 2p spectra contains six peaks: Ni^{2+} $2p_{3/2}$ / Ni^{2+} $2p_{1/2}$ (854.0/872.1 eV), Ni^{3+} $2p_{3/2}$ / Ni^{3+} $2p_{1/2}$ (855.7/874.0 eV) and satellite peaks (861.0/879.9 eV)(**Fig. S6b**).[2]

References

[1] Huang P, Ying H, Zhang S, et al. Molten Salts Etching Route Driven Universal Construction of MXene/Transition Metal Sulfides Heterostructures with Interfacial Electronic Coupling for Superior Sodium Storage[J]. Advanced Energy Materials, 2022, 12(39): 2202052.

[2] Huang P, Zhang S, Ying H, et al. Few-Layered Ti_3C_2 MXene Anchoring Bimetallic Selenide $NiCo_2Se_4$ Nanoparticles for Superior Sodium-Ion Batteries[J]. Chemical Engineering Journal, 2021, 417: 129161.

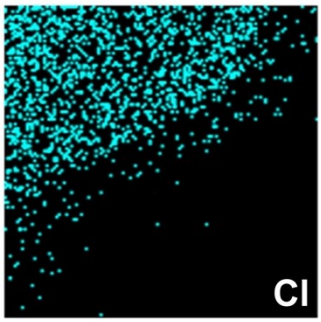

Fig. S7 Cl elemental mapping image of TCC hybrids.

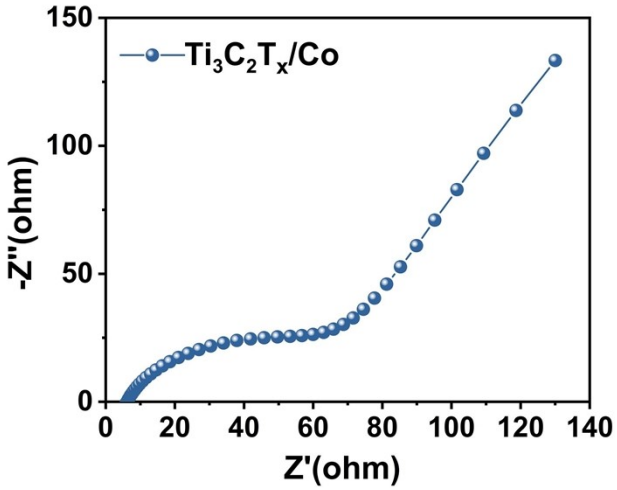

Fig. S8 EIS spectra of the asymmetric cell with $Ti_3C_2T_x$/Co electrode before cycling.

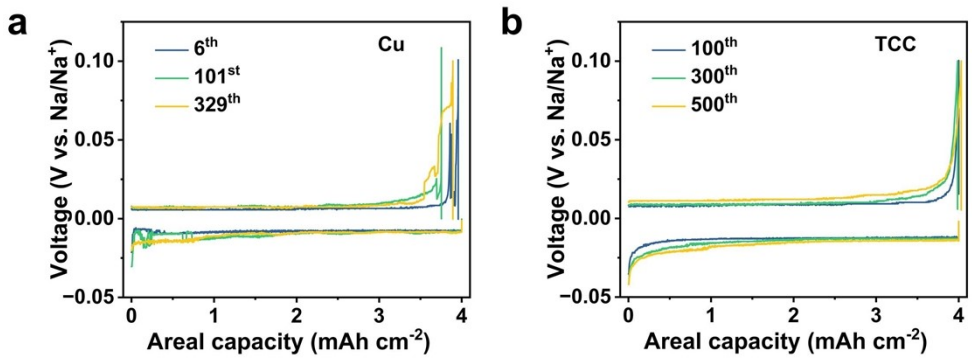

Fig. S9 Voltage-capacity curves of (a) Cu and (b) TCC electrode under different cycles at 2 mA cm^{-2} and 4 mAh cm^{-2}.

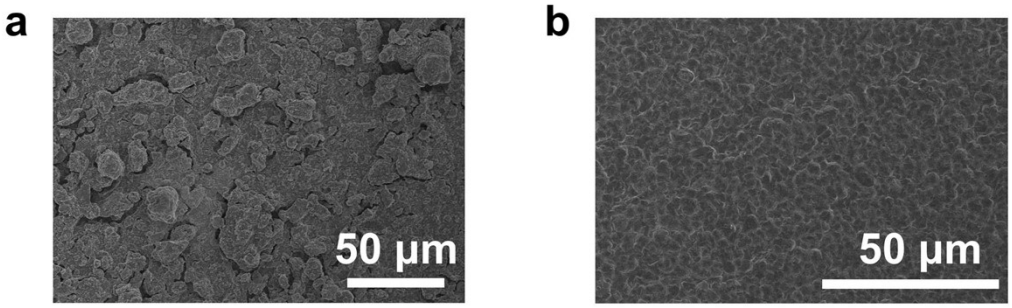

Fig. S10 SEM images of (a) TCC electrode and (b) bare Cu foil before Na deposition.

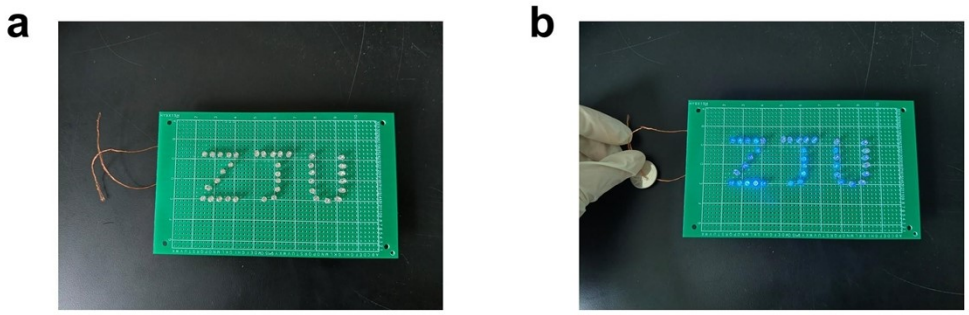

Fig. S11 (a-b) Light emitting diode panel powered by TCC-Na//NVP full cells.