

Three-dimensional N-doped mesoporous Carbon–MXene Hybrid Architecture for Supercapacitor Applications

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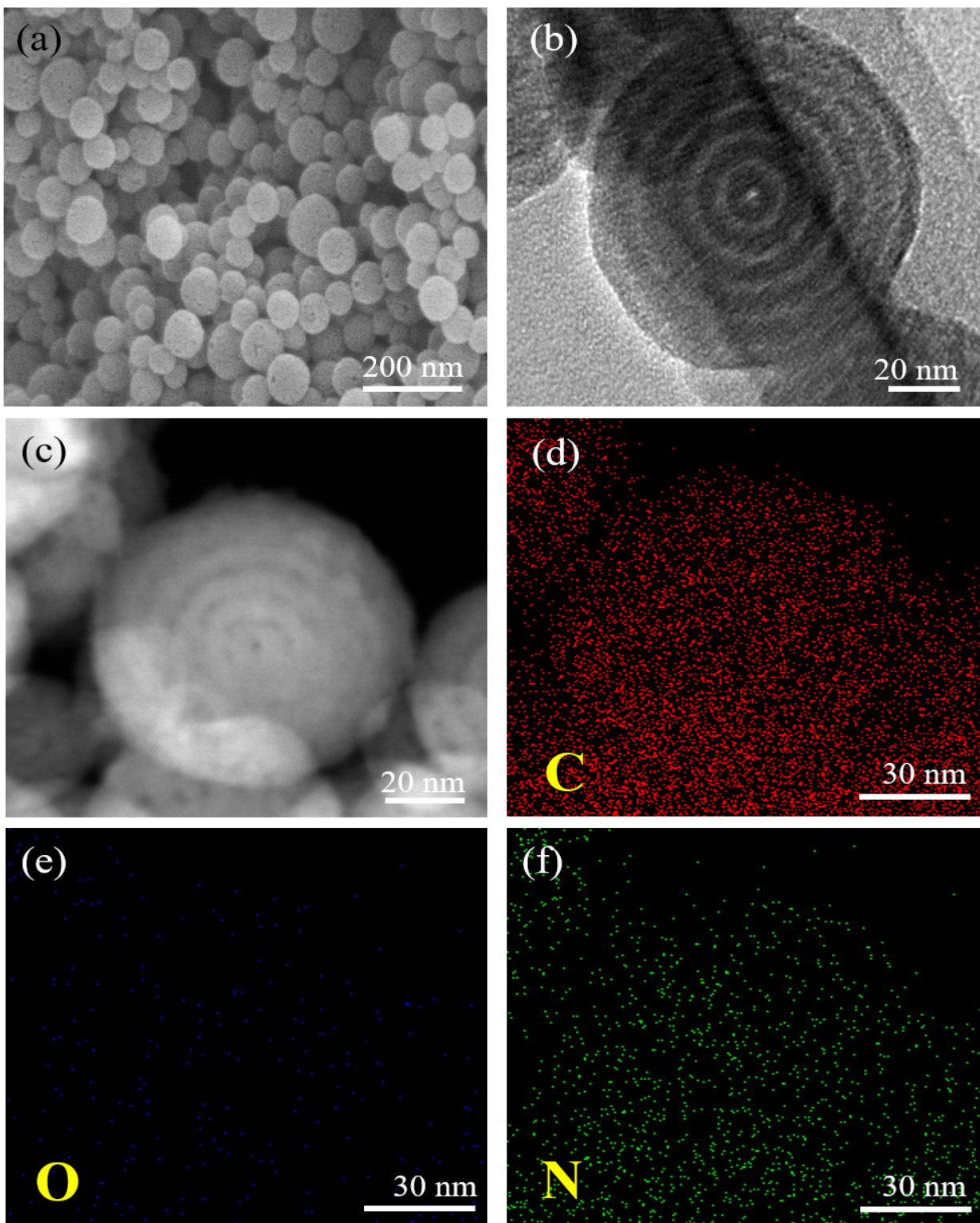


Figure S1: a) SEM of the as-prepared precursor of NMC (P123/PMF), b) TEM of NMC-900, and (c-f) HAADF-STEM image of NMC and its elemental mapping.

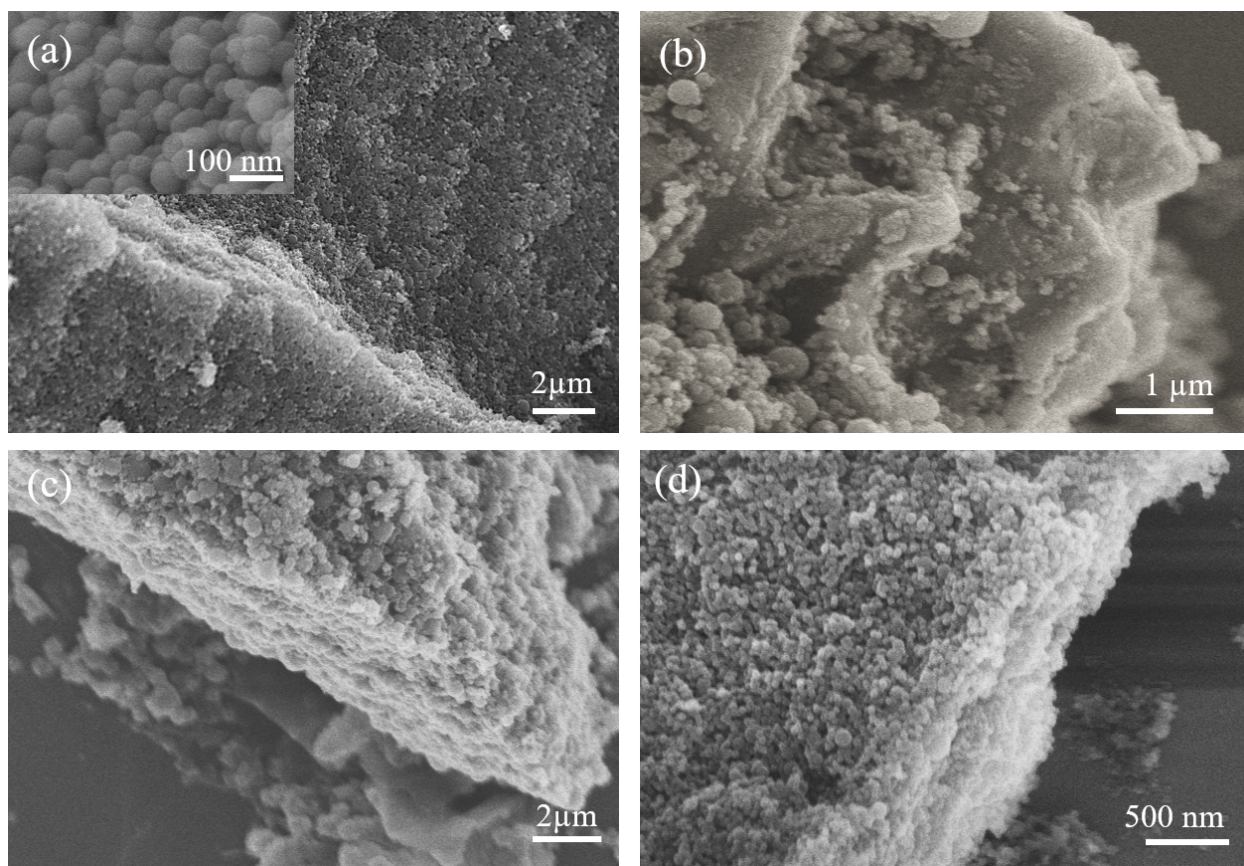


Figure S2 SEM image: (a–b) calcinated NMC@MXene-20, inset of figure (a) is a higher magnification SEM image; and (c–d) calcinated NMC@MXene-30

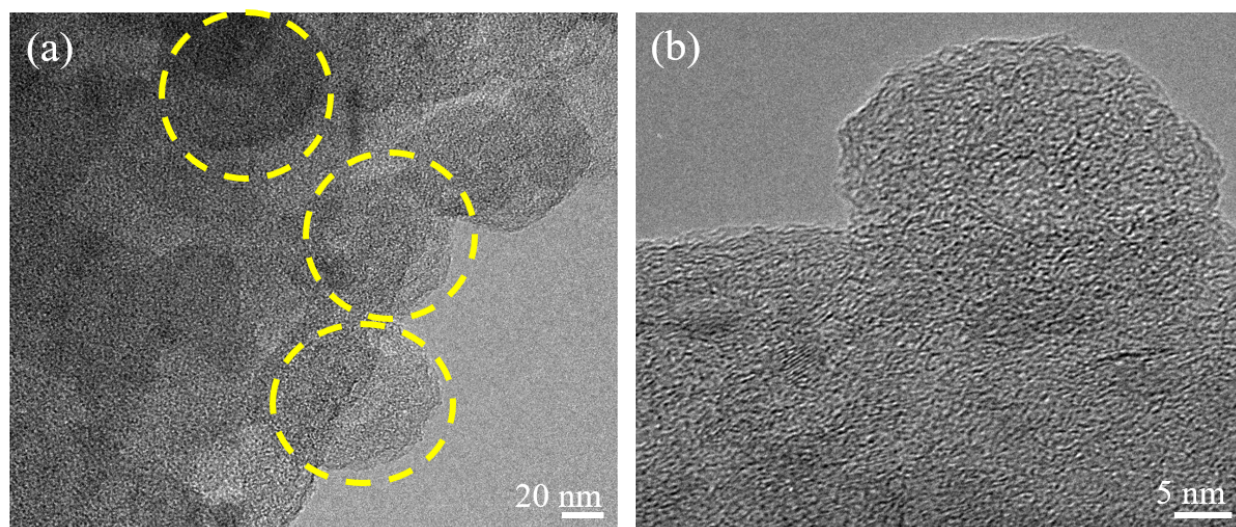


Figure S3: (a)TEM, and (b) HRTEM image of as-prepared NMC@MXene-10.

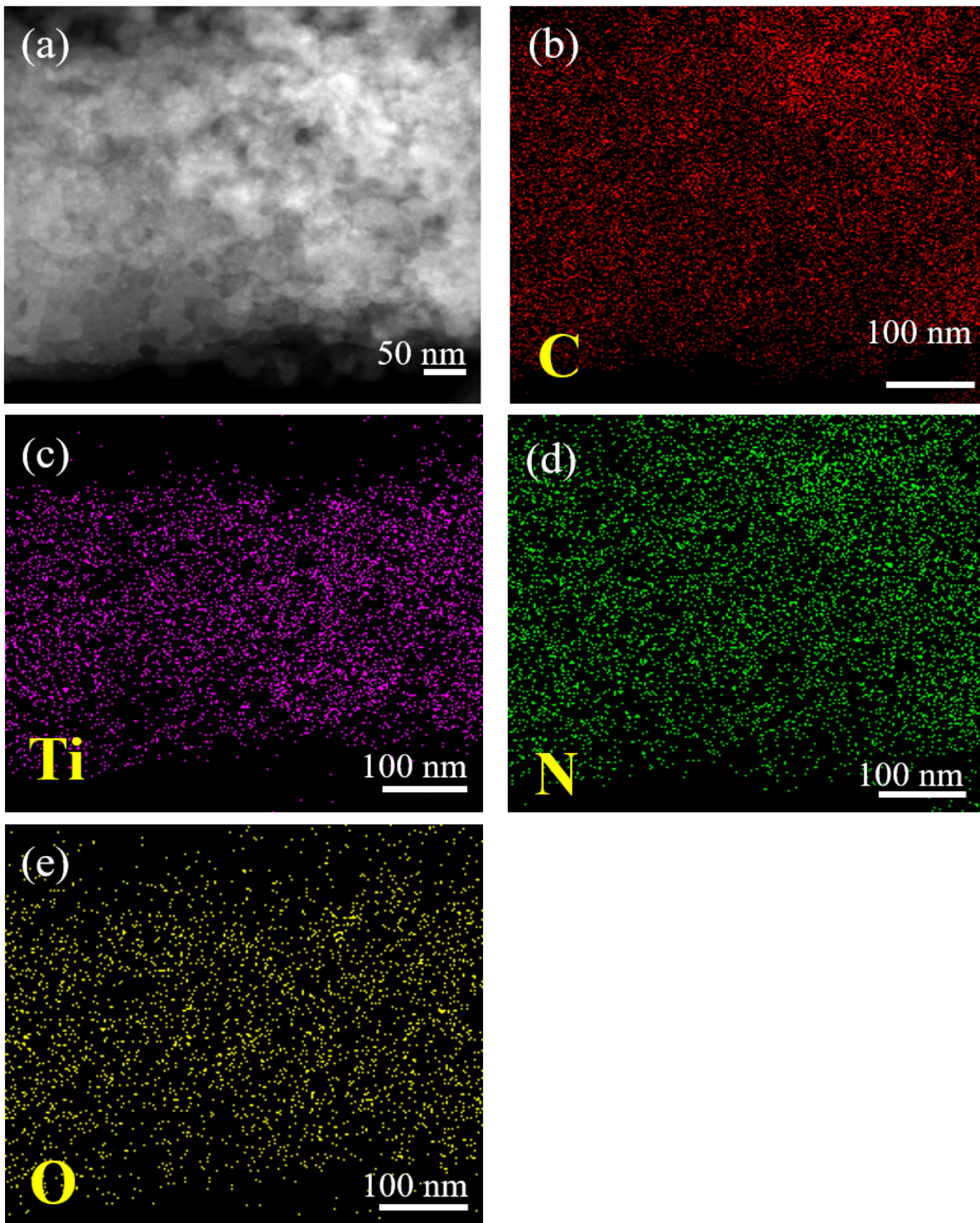


Figure S4: HAADF-STEM image of NMC@MXene-30 and its elemental mapping.

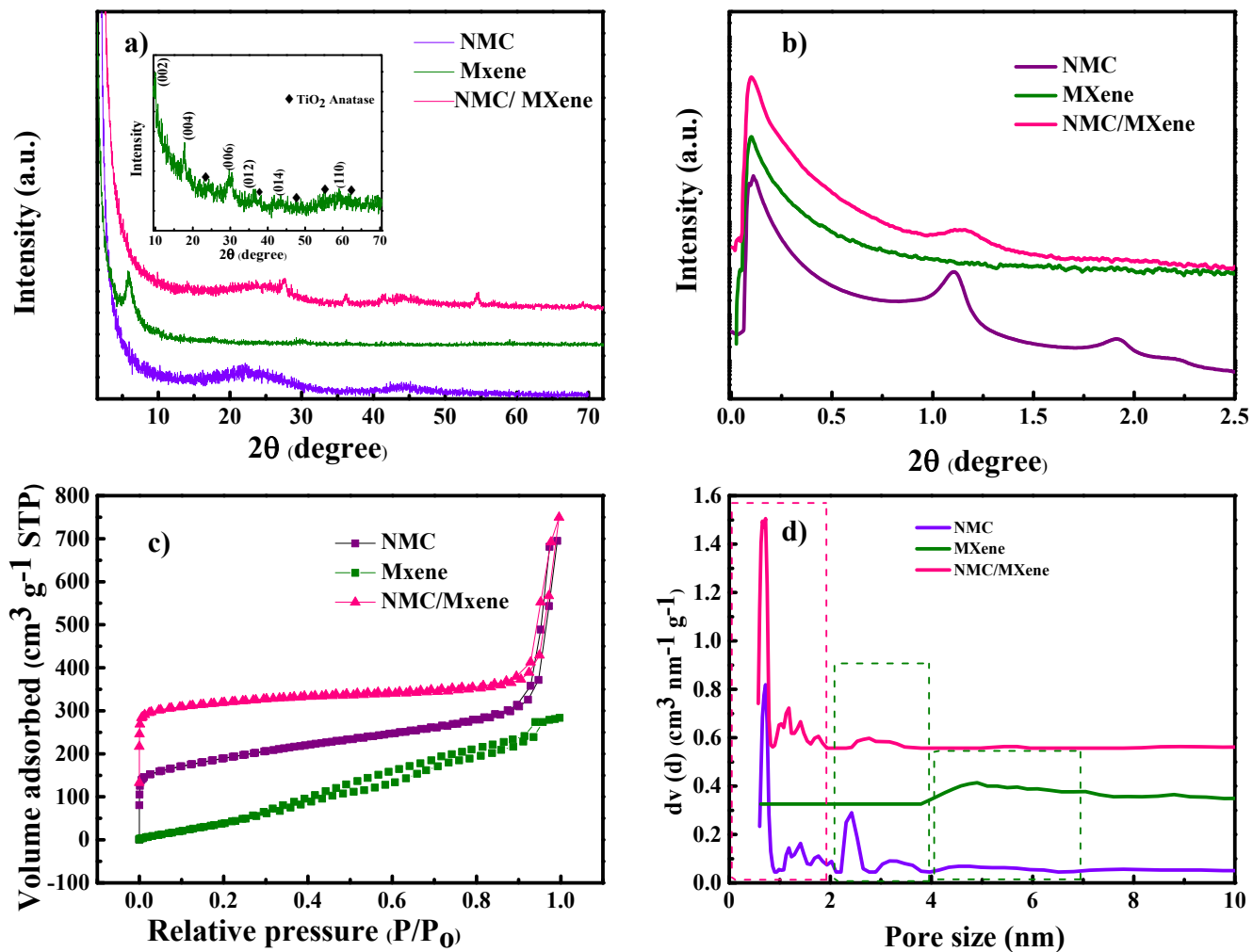


Figure S5 (a) XRD patterns; (b) SAXS patterns; (c) N₂ adsorption–desorption isotherms; and (d) Pore size distribution of NMC, MXene, and NMC/MXene.

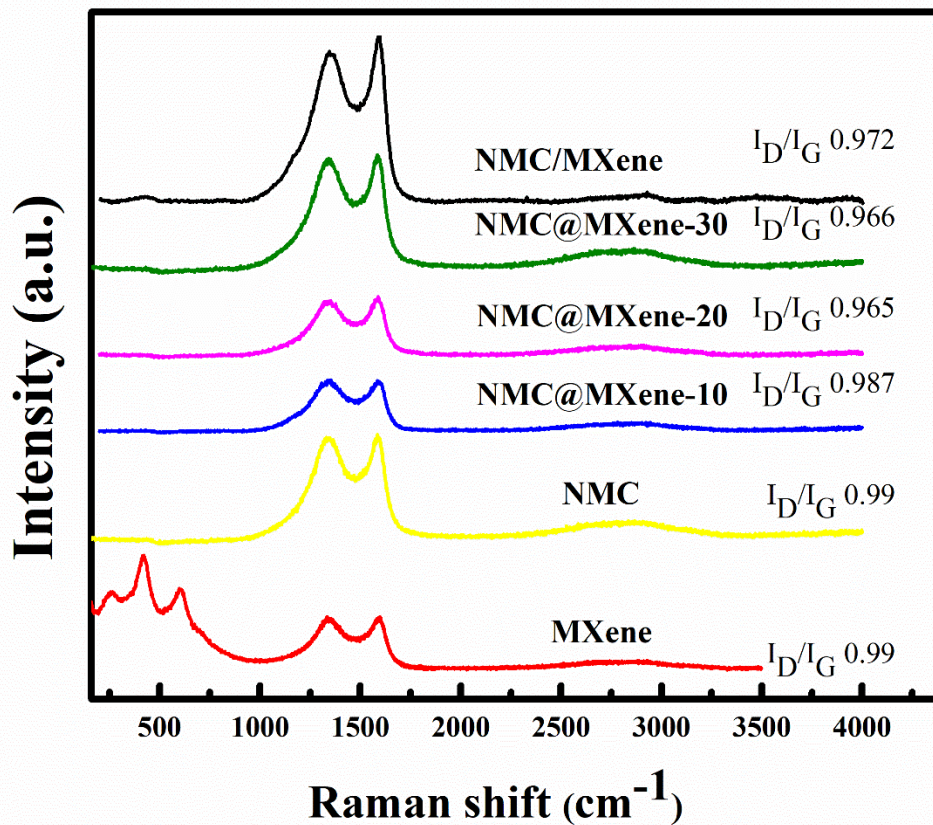


Figure S6: Raman spectra of MXene, NMC, NMC/MXene, and NMC@MXene -x (x=10, 20, and 30).

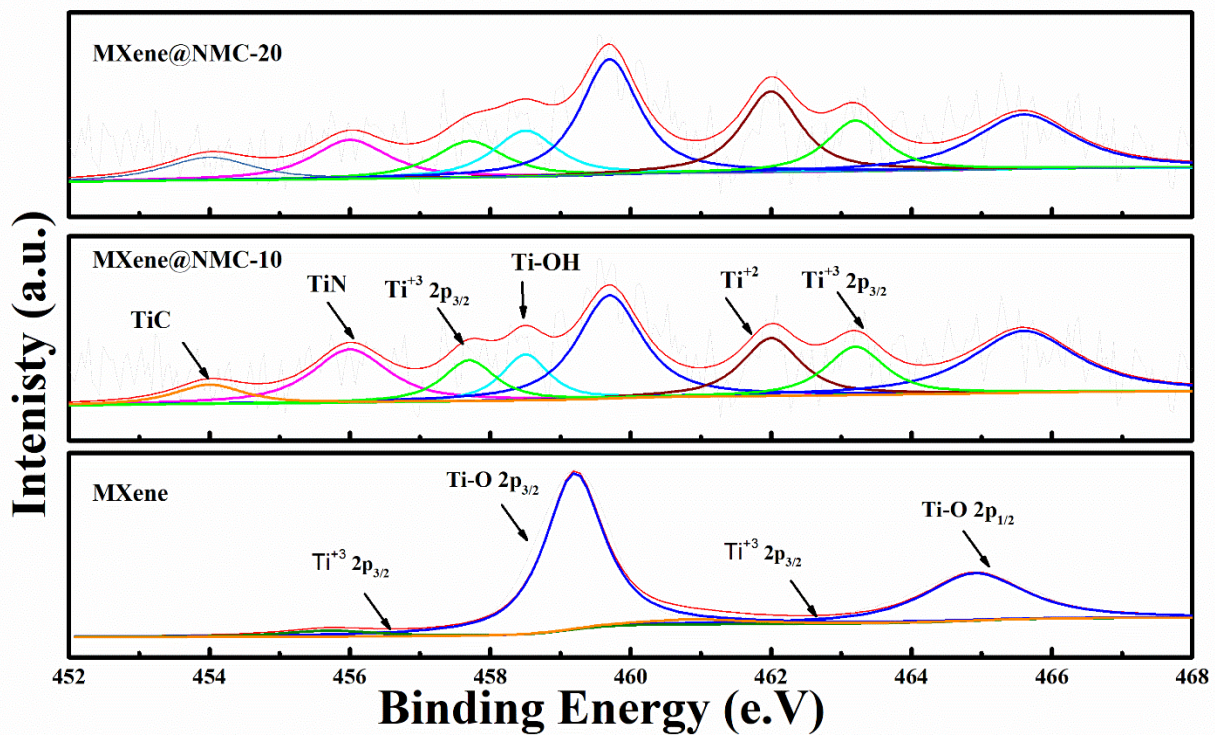


Figure S7: High-resolution XPS spectra of Ti 2p of (MXene, and NMC@MXene- x) samples after calcination, ($x=10$, and 20).

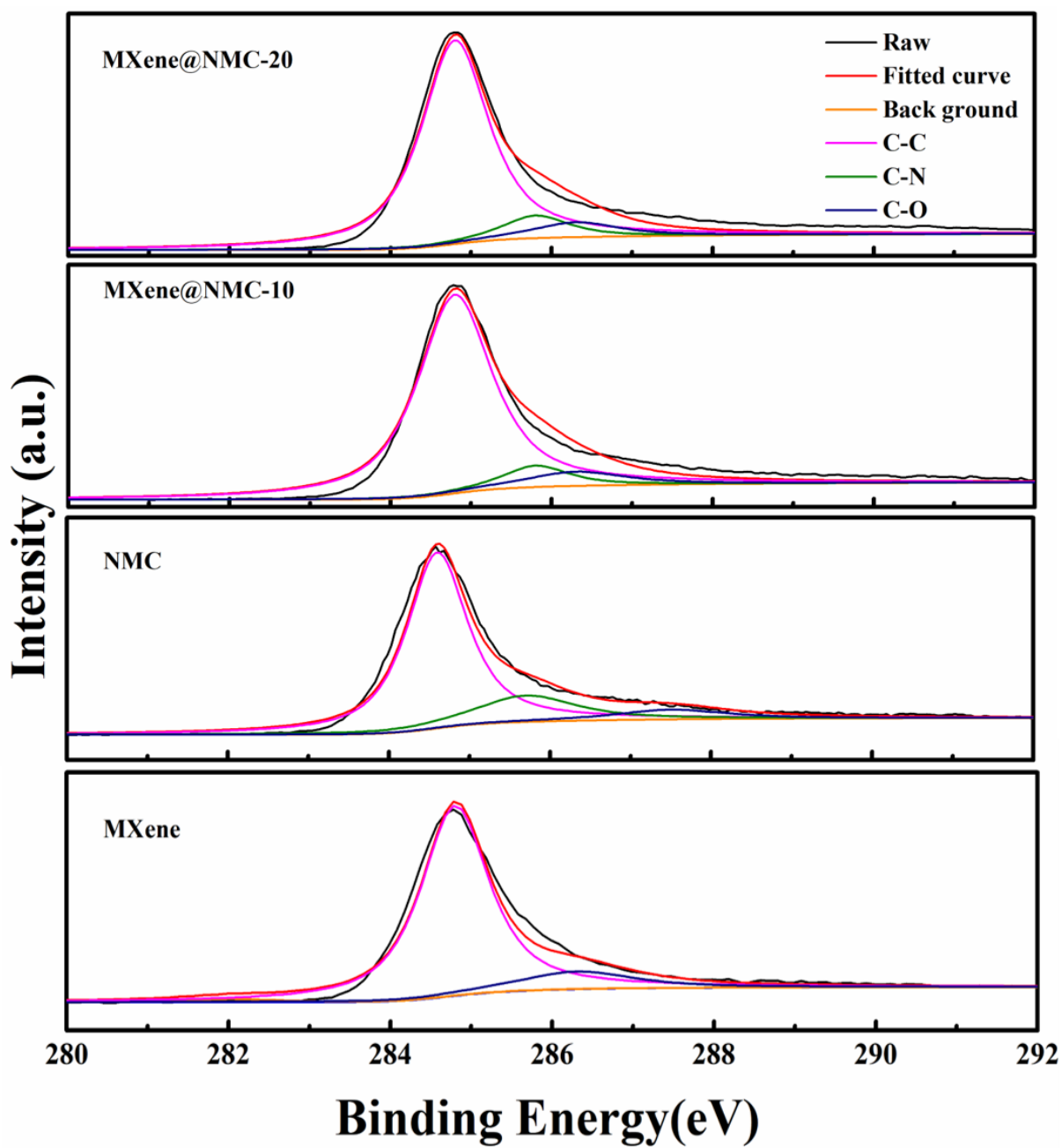


Figure S8: High-resolution XPS spectra of C 1s of (MXene, NMC, and NMC@MXene- x) samples after calcination, ($x=10$, and 20).

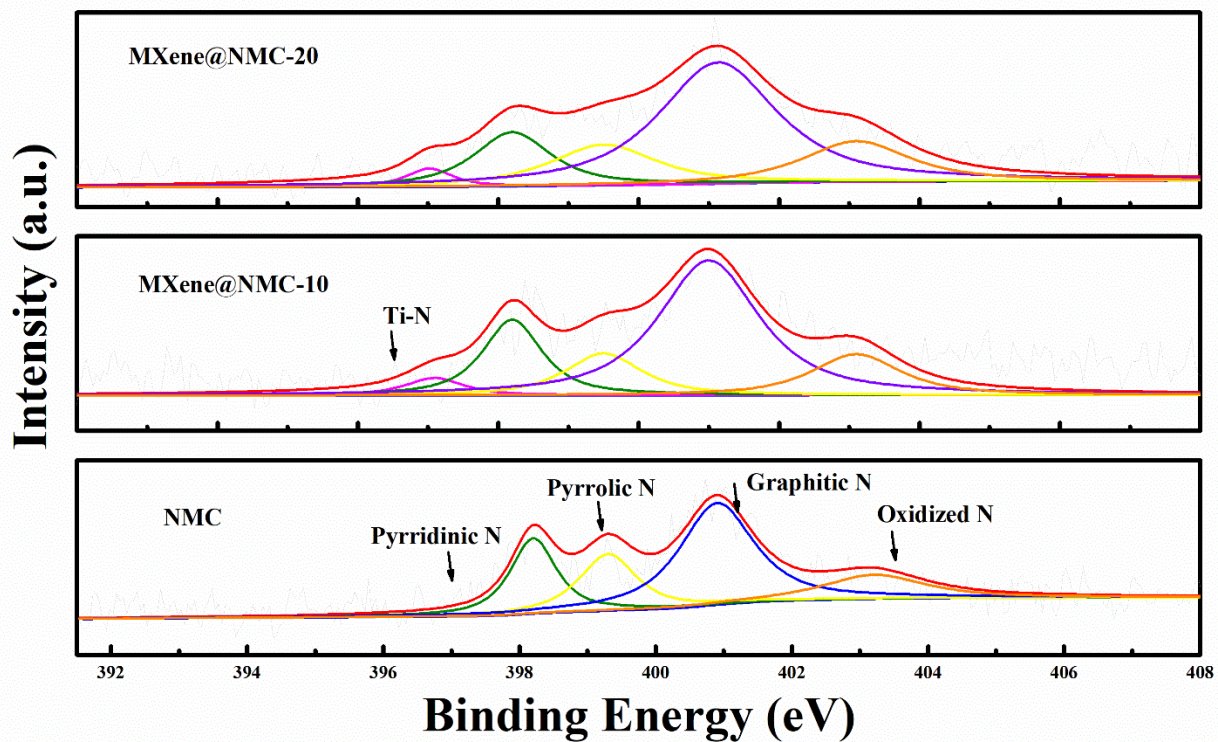


Figure S9: High-resolution XPS spectra of N1s of (NMC and NMC@MXene- x) samples after calcination, ($x=10$, and 20 ,).

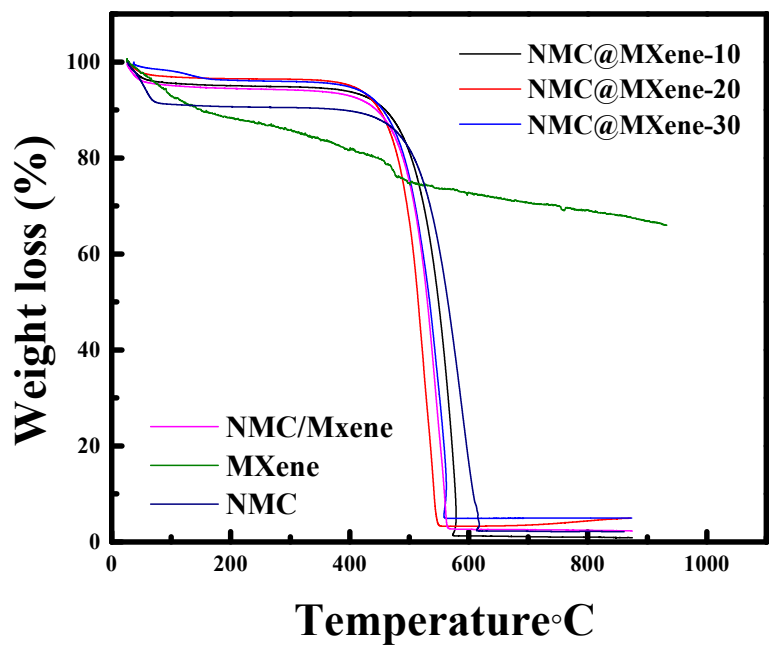


Figure S10: TGA curves of (NMC, MXene, NMC/MXene, and NMC@MXene- x) samples after calcination measured under air atmosphere, ($x=10, 20,$ and 30).

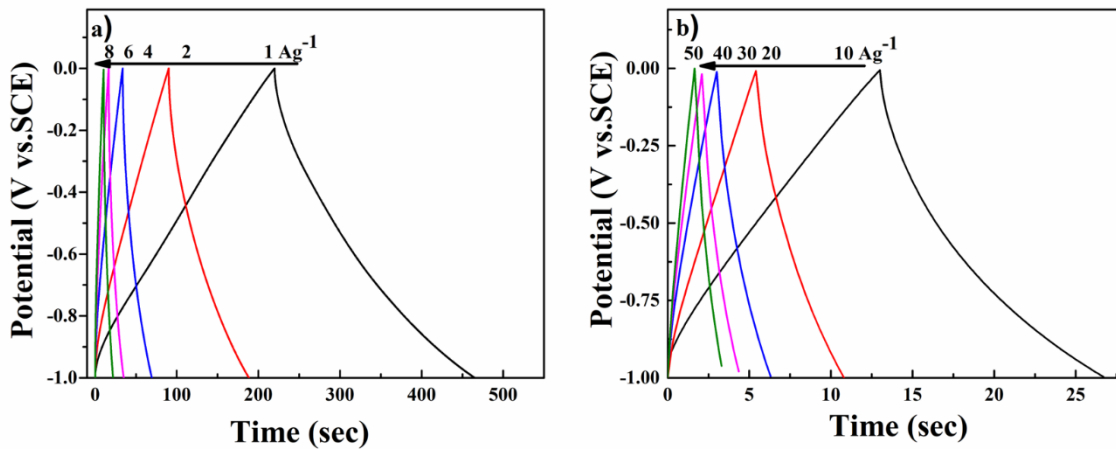


Figure S11: Charge discharge curve of NMC@MXene-10.

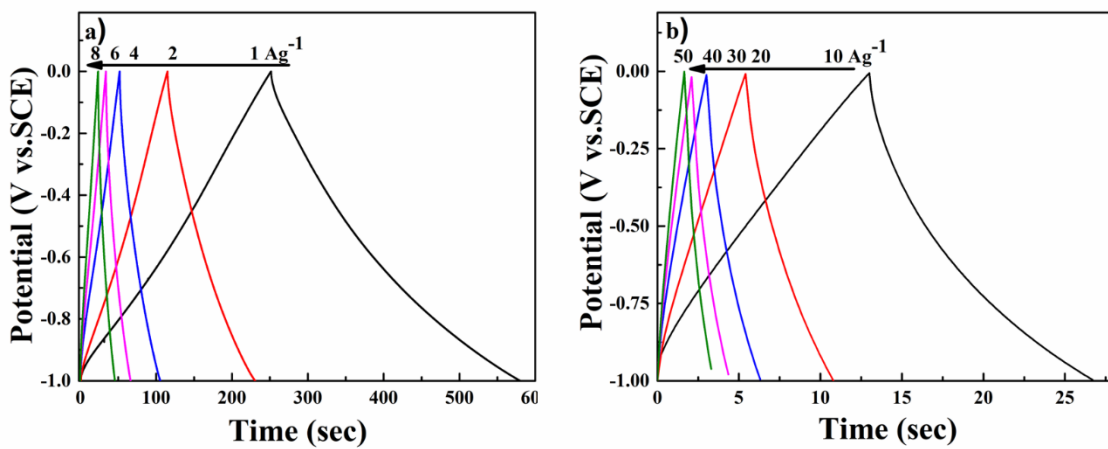


Figure S12: Charge discharge curve NMC@MXene-20.

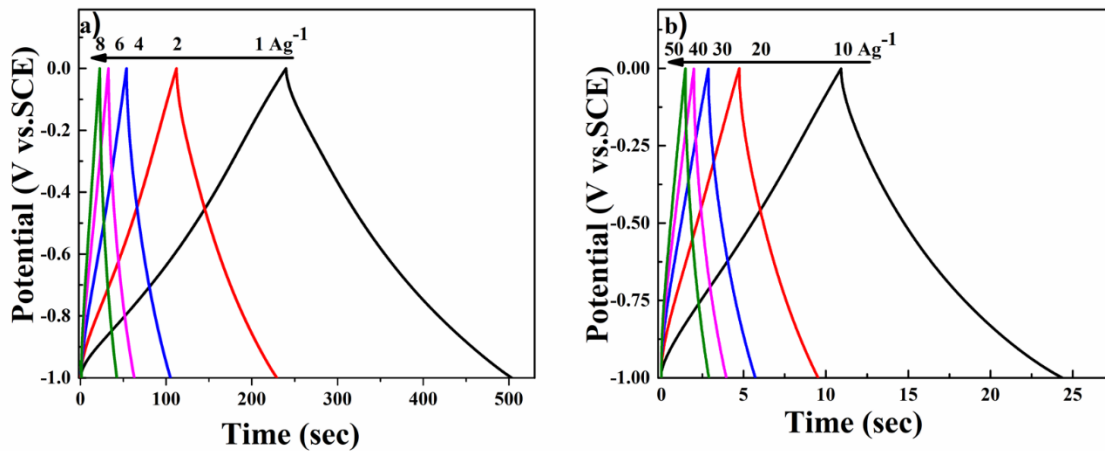


Figure S13: Charge discharge curve of NMC/MXene.

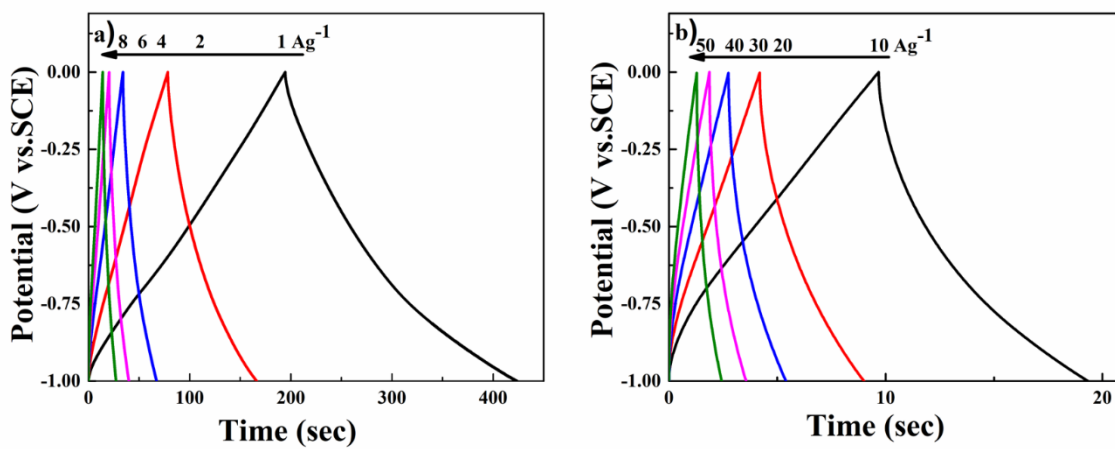


Figure S14: Charge discharge curve of MXene.

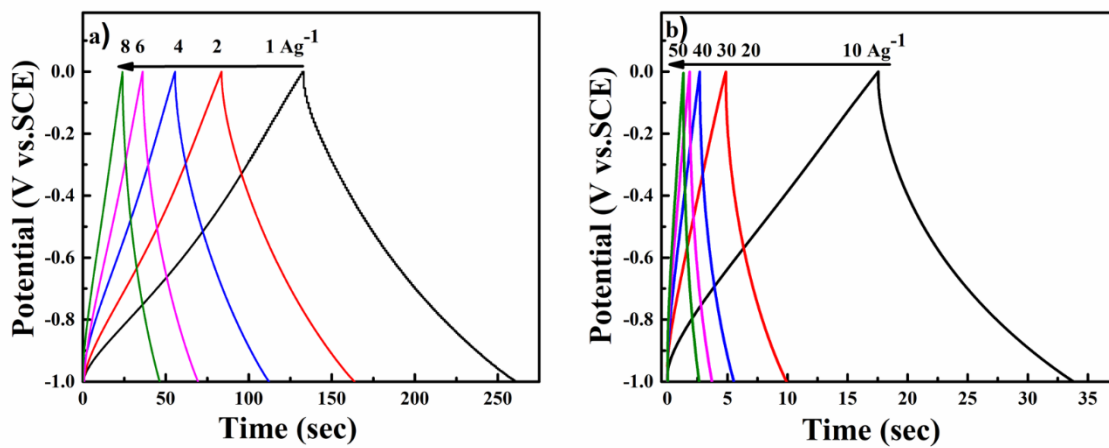


Figure S15: Charge discharge curve of NMC.

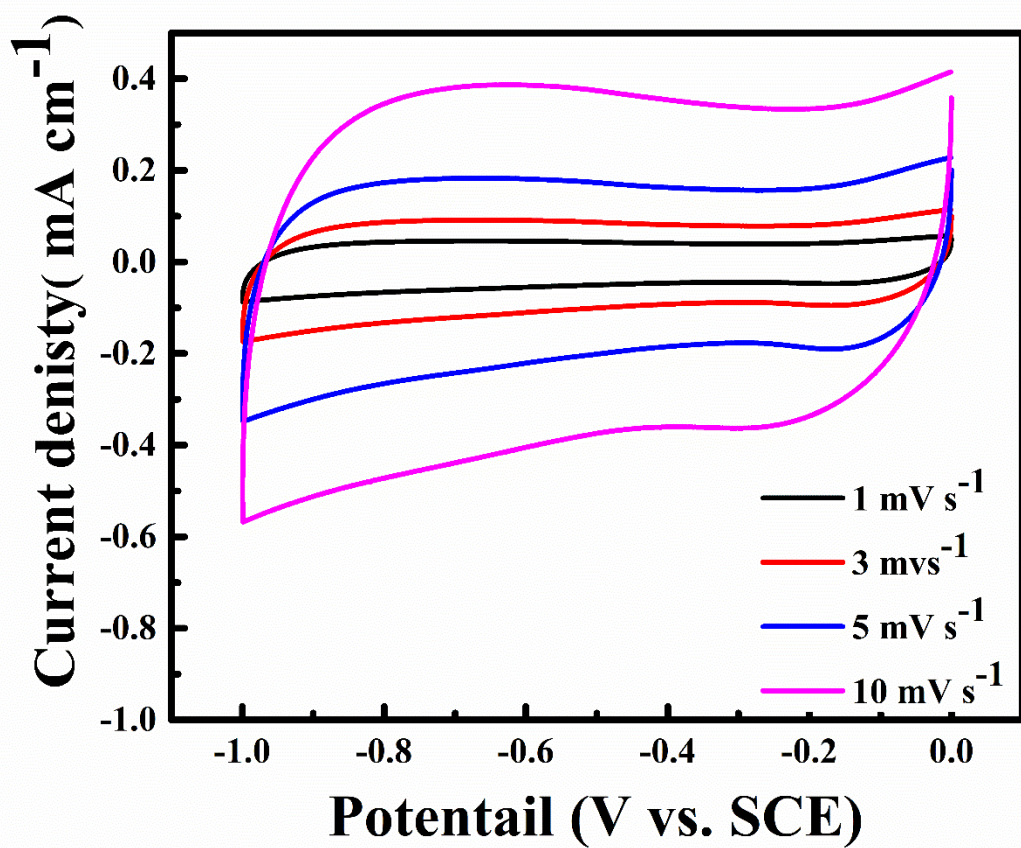


Figure S16 CV curves of NMC@MXene-30 in a two-electrode system at 1 mV s⁻¹, 3 mV s⁻¹, 5 mV s⁻¹, 10 mV s⁻¹

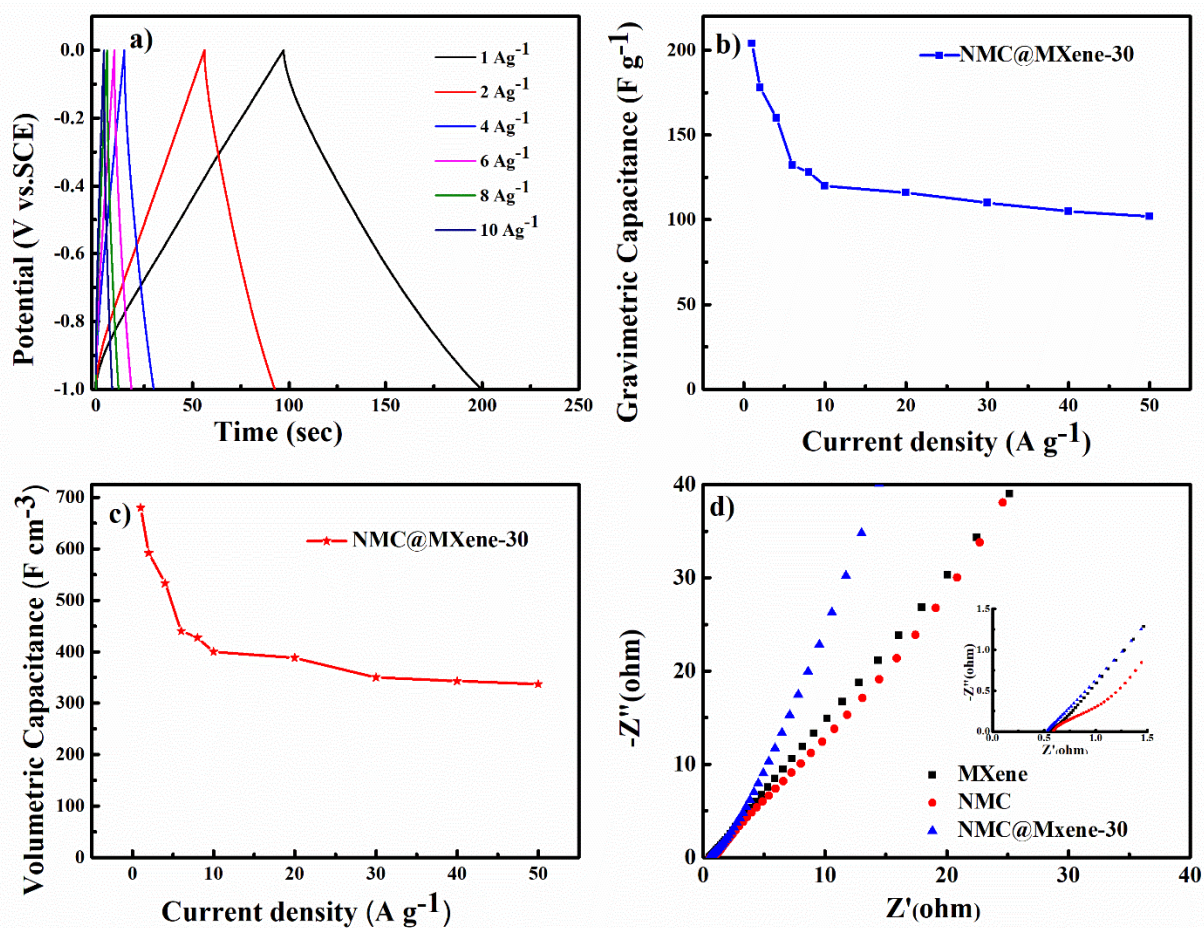


Figure S17: Electrochemical performances of NMC@MXene-30 in a two-electrode system: (a) Charge discharge curves at various current densities, (b) gravimetric capacitance, (c) volumetric capacitance at different current densities and (d) Nyquist plots of the MXene, NMC and NMC@MXene-30 tested in the symmetric cell.