

Supporting Information

Mesoporous nitrogen-rich carbons derived from protein for ultra-high capacity battery anodes and supercapacitors

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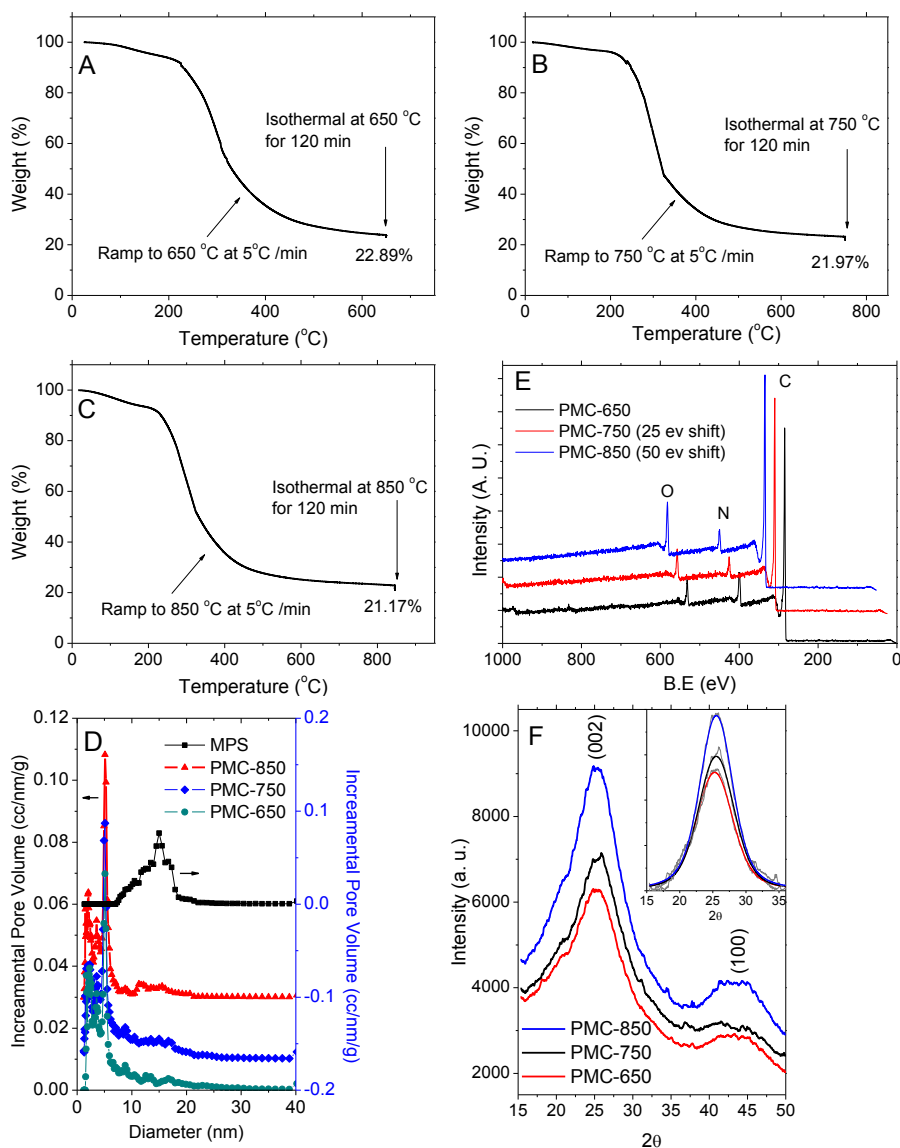


Figure S1 Thermogravimetric Analysis curves of dry egg white, performed using the same heating profile as the pyrolysis process for the PMC samples (A-C); DFT pore-size distribution (D), XPS survey spectra (E) and XRD patterns (F) of PMC carbons. The inset in (F) shows the (002) diffraction peak that was fit with a Voigt function to obtain the FWHM for each PMC specimen.

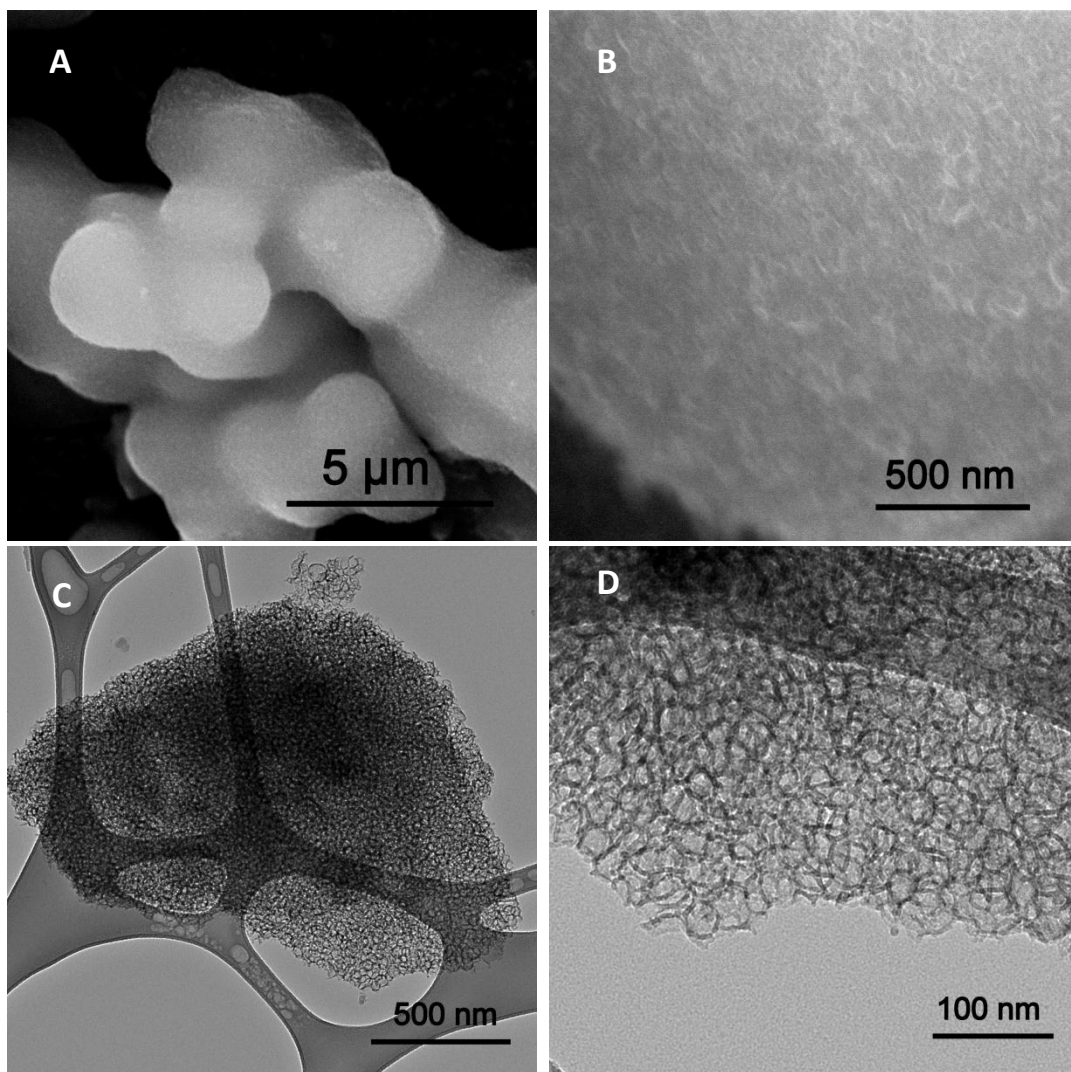


Fig. S2 SEM images (A, B) and TEM images (C, D) of the mesoporous cellular foam silica template used in this work.

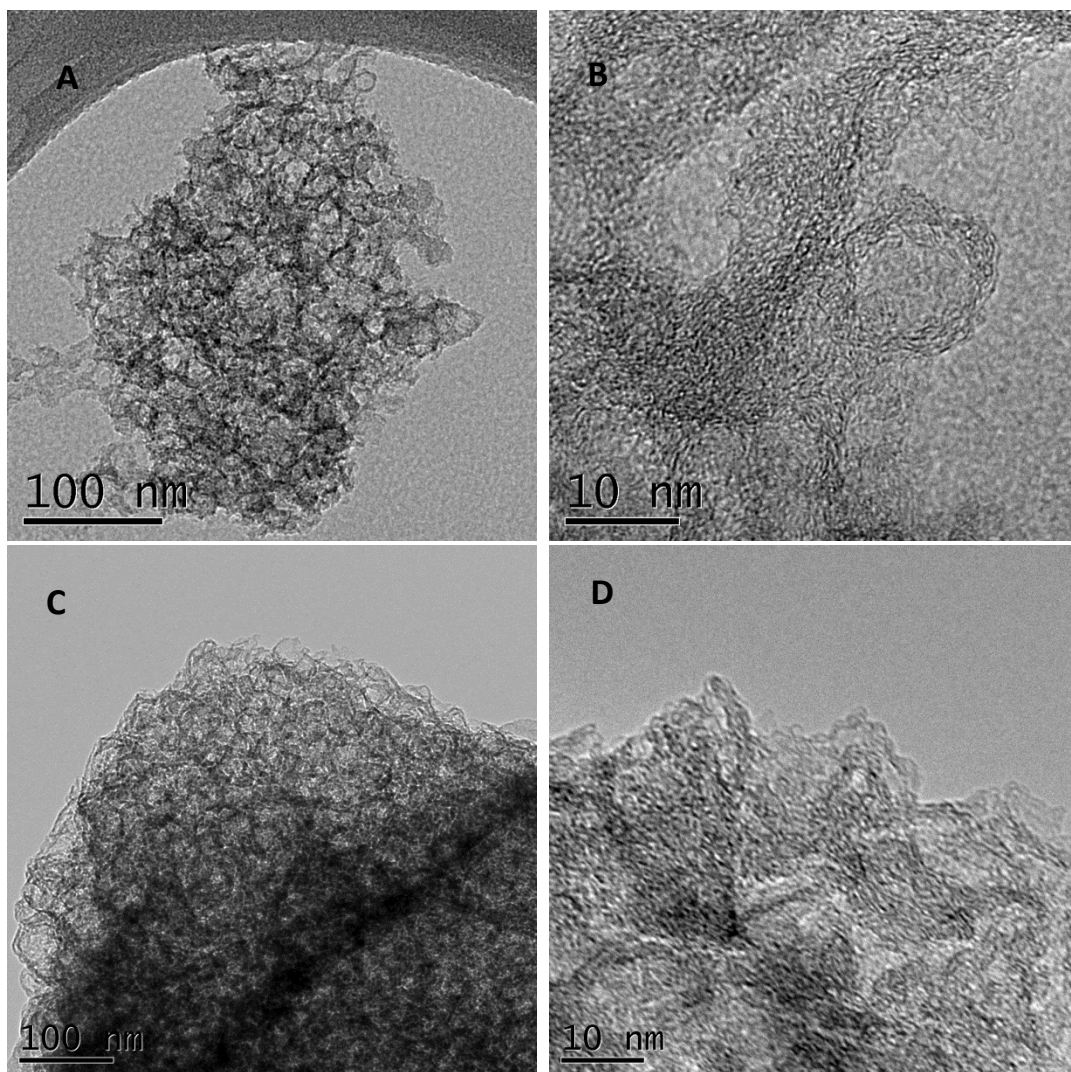


Fig. S3 TEM images of PMC-750 (A, B) and PMC-650 (C, D).

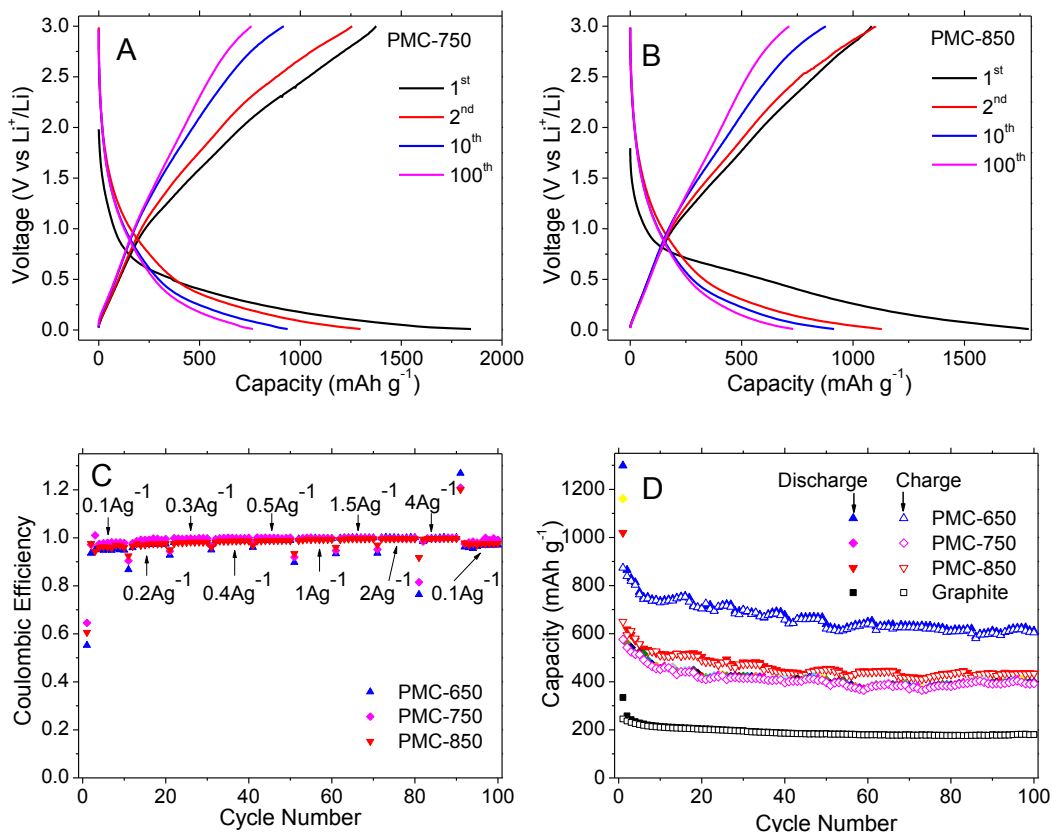


Fig. S4 Electrochemical performance of PMC carbons in a LIB half-cell configuration vs. Li metal. Charge/discharge curves of PMC-750 (A) and PMC-850 (B); Coulombic efficiency various rate (C); Charge/discharge capacity versus cycle number at 0.5 A g⁻¹ (D).

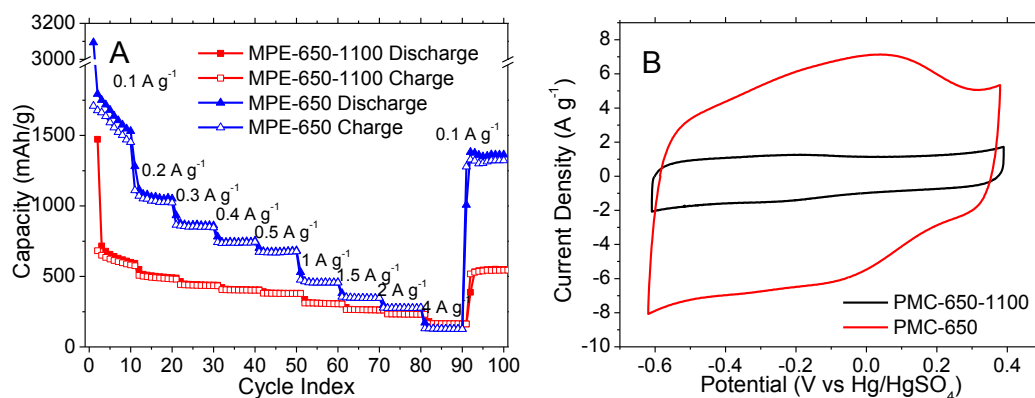


Fig. S5 Electrochemical performance of PMC-650 before and after eliminating the surface functionalities by heating to 1100°C in argon (PMC-650-1100). Charge/discharge capacity versus cycle number for carbons in a LIB half-cell configuration vs. Li metal (A); Cyclic voltammograms at 20 mV/S in 1M H₂SO₄ (B).

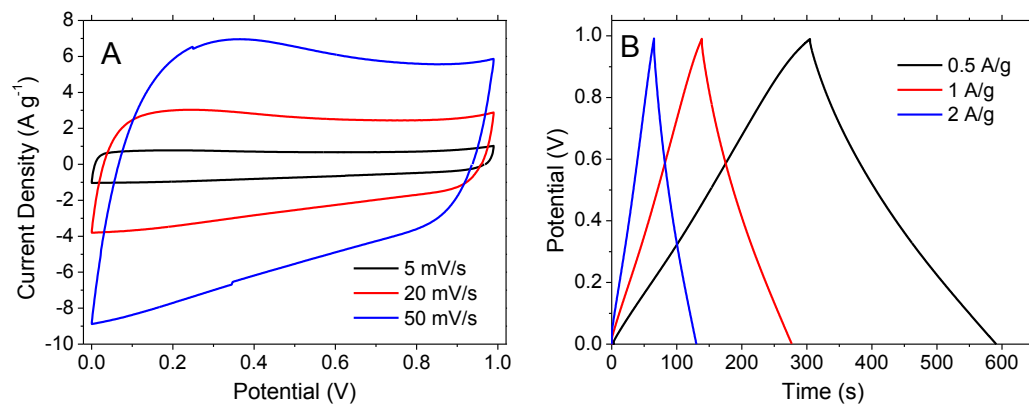


Fig. S6 Electrochemical performance of PMC-650 for supercapacitor in a 2-electrode symmetric cell configuration in 1M H₂SO₄; cyclic voltammograms at 5, 20 and 50 mV/S (A); galvanostatic charge/discharge curves at 0.5, 1 and 2 A g⁻¹ (B). The current density is calculated according to the mass of active material on single electrode.