Electronic Supplementary Material (ESI) for Inorganic Chemistry Frontiers.

Supporting Information

Enhanced Lithium-Ion Storage of SiO_x@C Anode Enabled by Carbon Coating Coupling with MXene as a Conductive Binder

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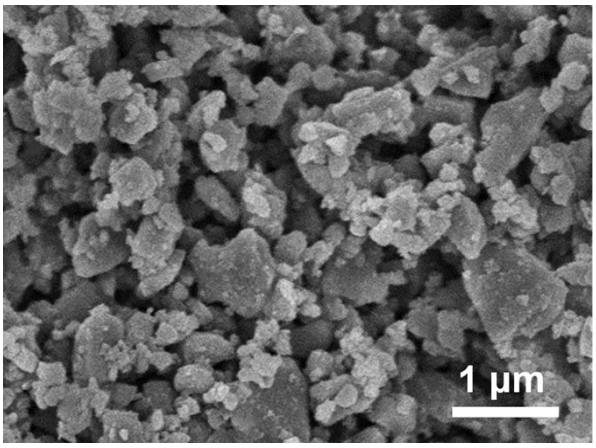

Fig. S1 SEM image of ball-milled SiO_x.

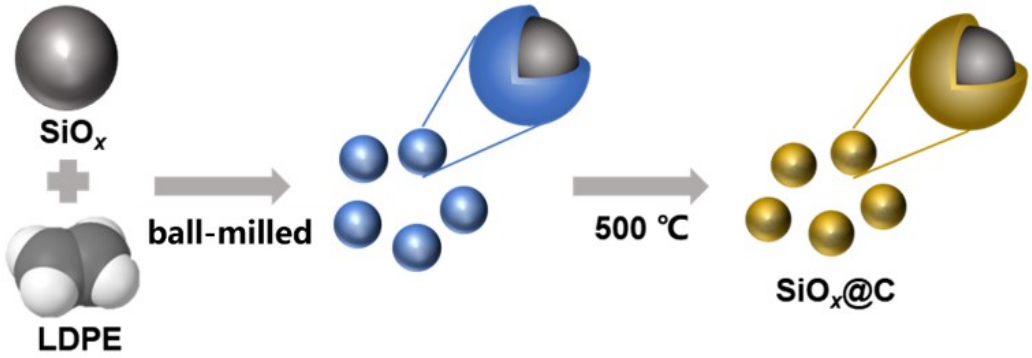

Fig. S2 Schematic for the preparation of SiO_x@C.

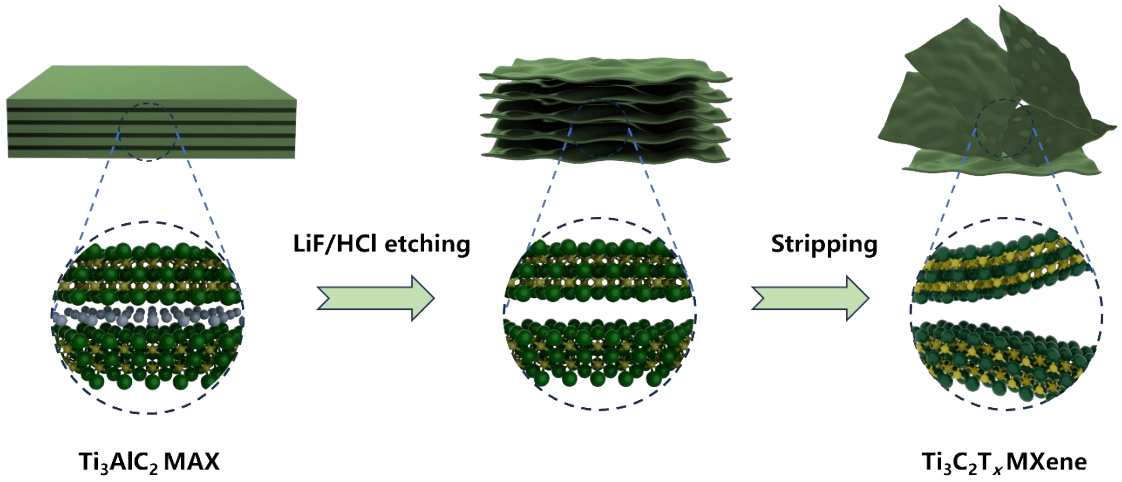

Fig. S3 Schematic for the preparation of $Ti_3C_2T_x$ MXene.

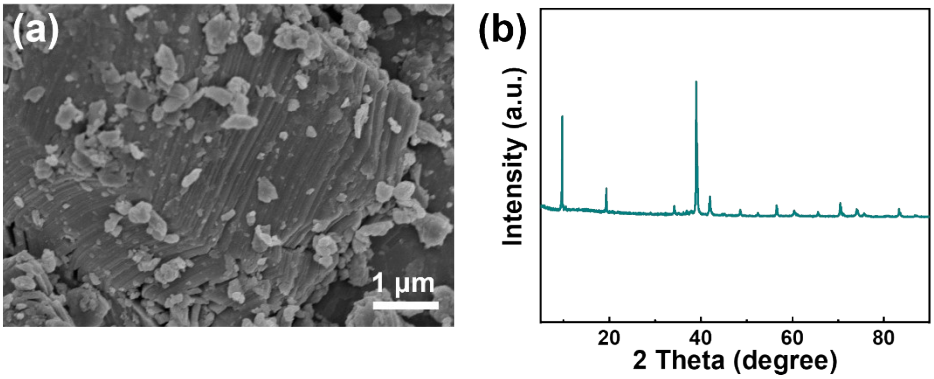

Fig. S4 (a) SEM image and (b) XRD pattern of Ti_3AlC_2 powder.

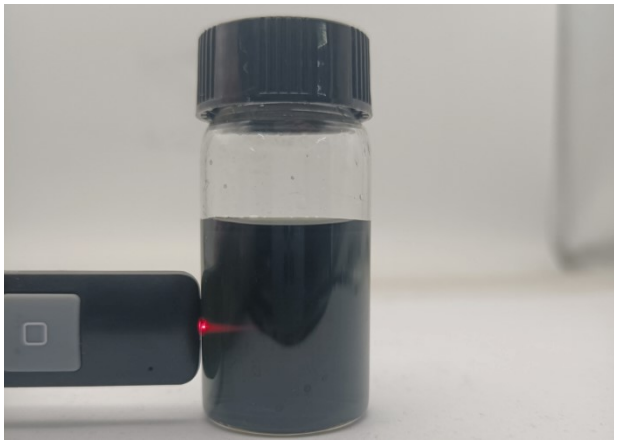

Fig. S5 Optical image of $Ti_3C_2T_x$ MXene dispersion.

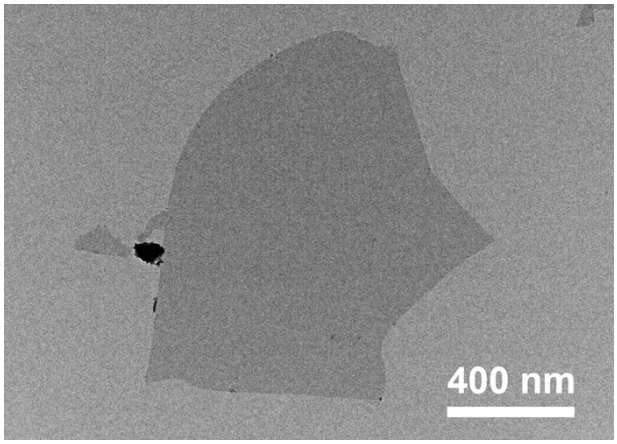

Fig. S6 TEM image of $Ti_3C_2T_x$ MXene.

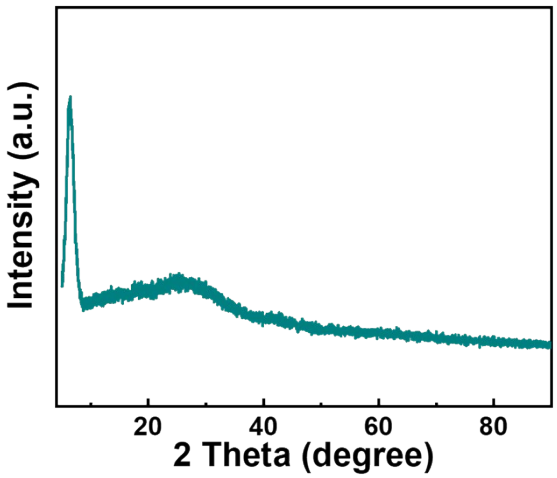

Fig. S7 XRD pattern of $Ti_3C_2T_x$ MXene.

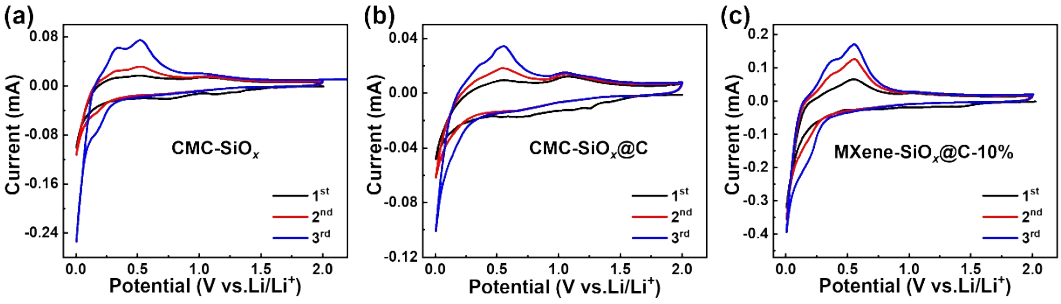

Fig. S8 CV curves of (a) CMC-SiO_x, (b) CMC-SiO_x@C and (c) MXene-SiO_x@C-10% at 0.1 mV s^{-1}.

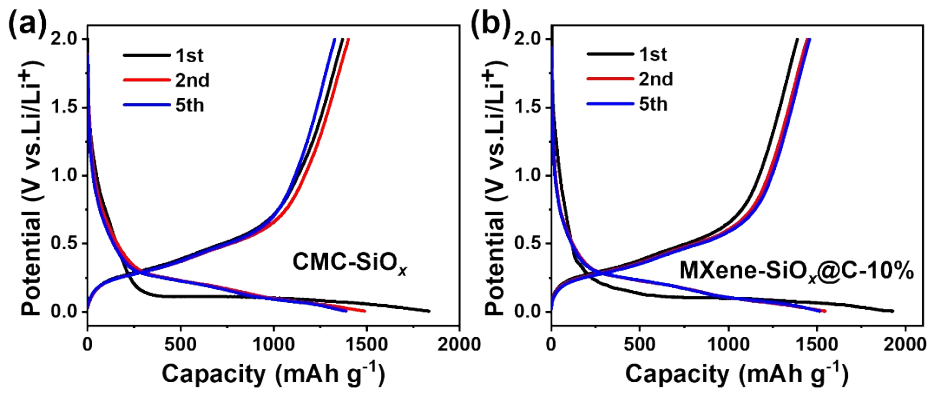

Fig. S9 Charge/discharge curves of (a) CMC-SiO_x and (b) MXene-SiO_x@C-10% at 0.1 A g^{-1}.

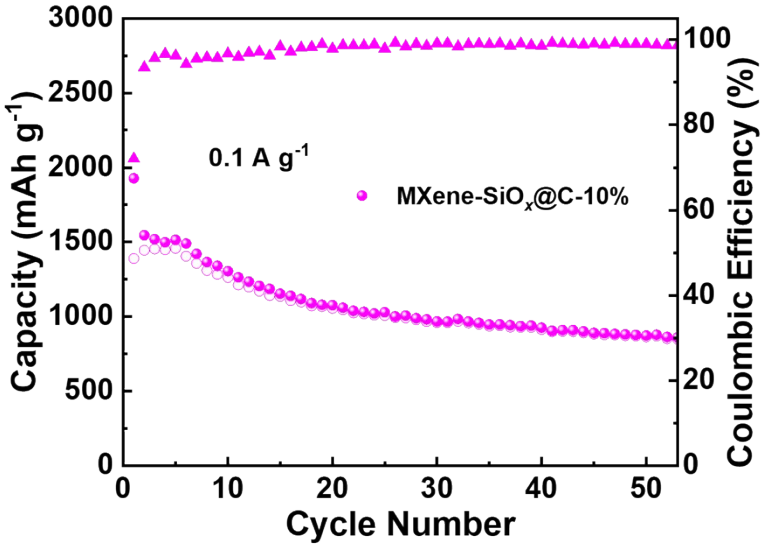

Fig. S10 Cycling performance of MXene-SiO_x@C-10%.

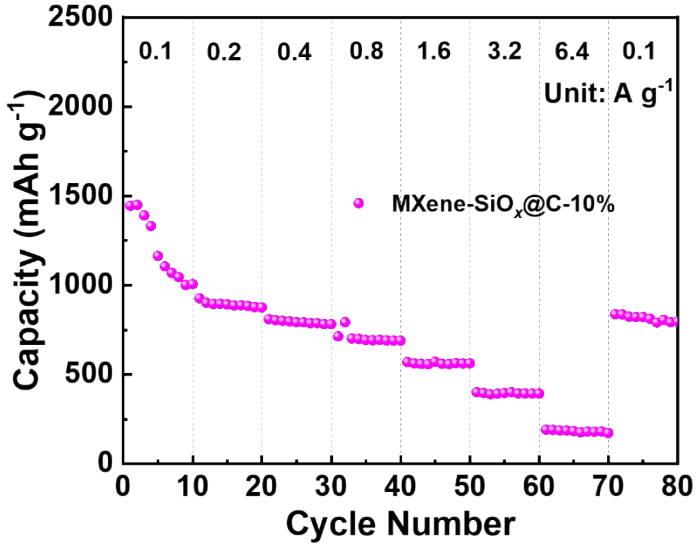

Fig. S11 Rate capability of MXene-SiO_x@C-10%.

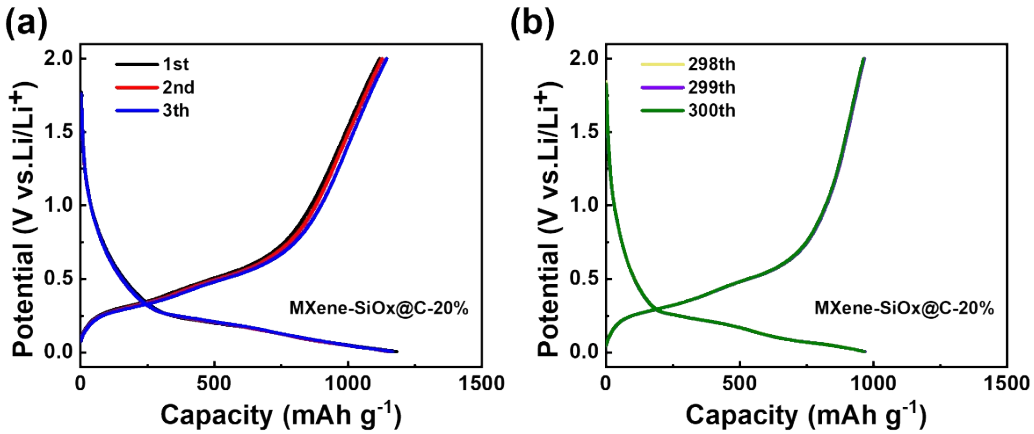

Fig. S12 Charge/discharge curves of MXene-SiO_x@C-20% at (a) 1~3 and (b) 298~300 cycles at 0.8 A g^{-1}.

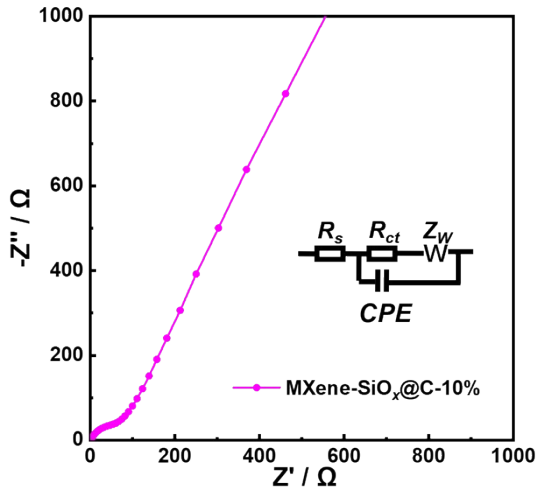

Fig. S13 Nyquist plots of MXene-SiO$_x$@C-10% with the equivalent circuit in the inset.

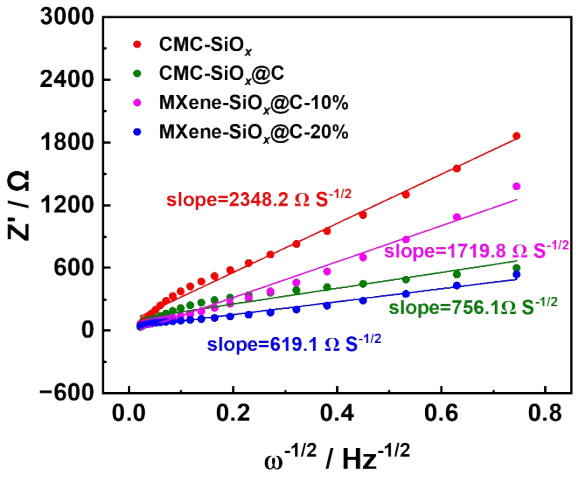

Fig. S14 Relationship between Z' and $\omega^{-1/2}$ in the low-frequency region of EIS spectra of the electrodes.

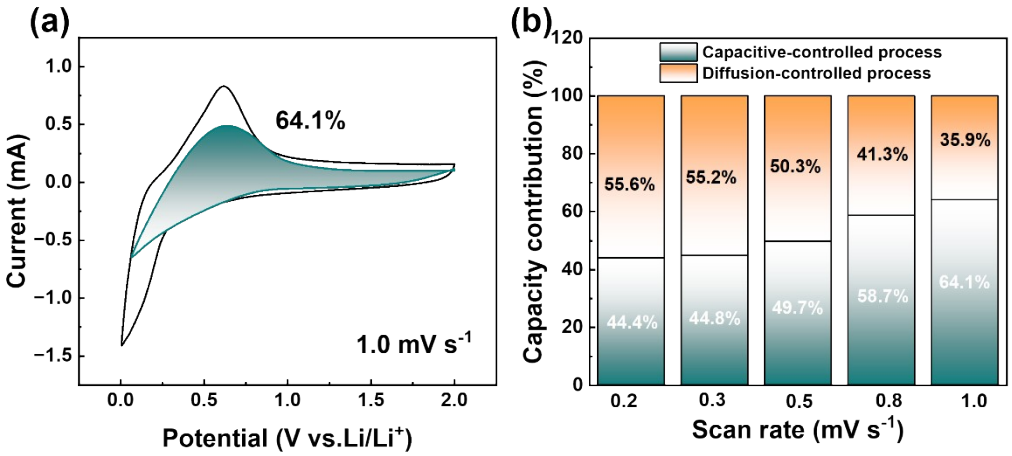

Fig. S15 (a) Contribution ratio of the capacitive process of MXene-SiO_x@C-20% at 1.0 mV s^{-1}; (b) Capacitive contribution of MXene-SiO_x@C-20% at different scanning rates in the range of 0.2~1 mV s^{-1}.

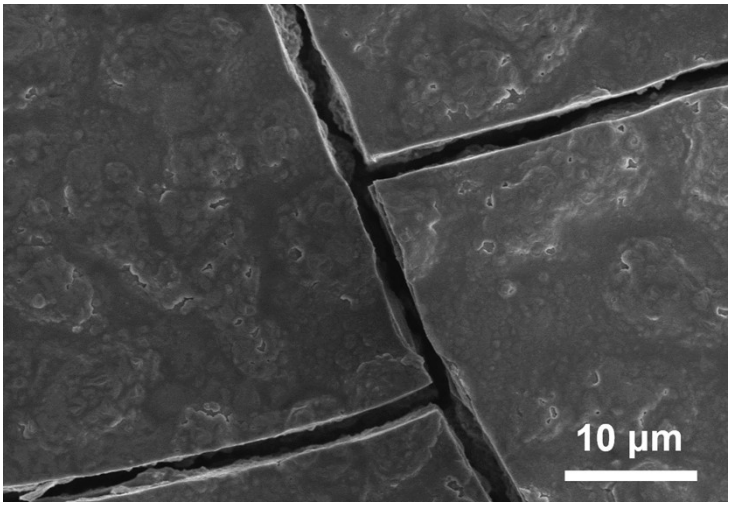

Fig. S16 SEM image of MXene-SiO_x@C-10% after 50 cycles at 0.1 A g^{-1}.

Table S1 EIS parameters of the electrodes.

	R_s (Ω)	R_{ct} (Ω)
CMC-SiO_x	0.5	635.1
CMC-SiO_x@C	1.7	214.0
MXene-SiO_x@C-10%	1.9	82.7
MXene-SiO_x@C-20%	2.2	41.9