Supporting Information for

Plate-to-layer Bi$_2$MoO$_6$/MXene Heterostructured Anode for Lithium Ion Batteries

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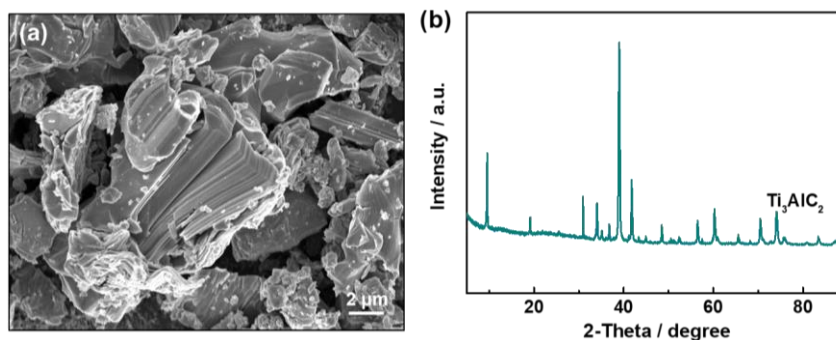## Supplementary Figures and Table

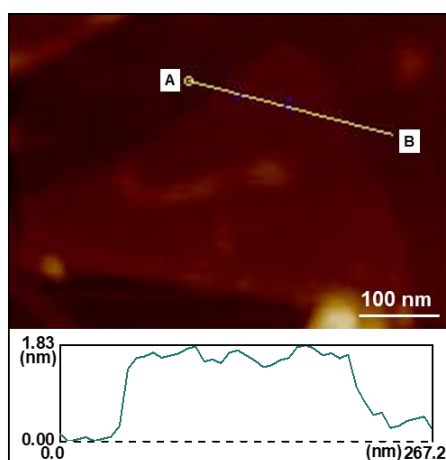**Fig. S1 a** SEM image, **b** XRD pattern of the Ti$_3$AlC$_2$ MAX phase

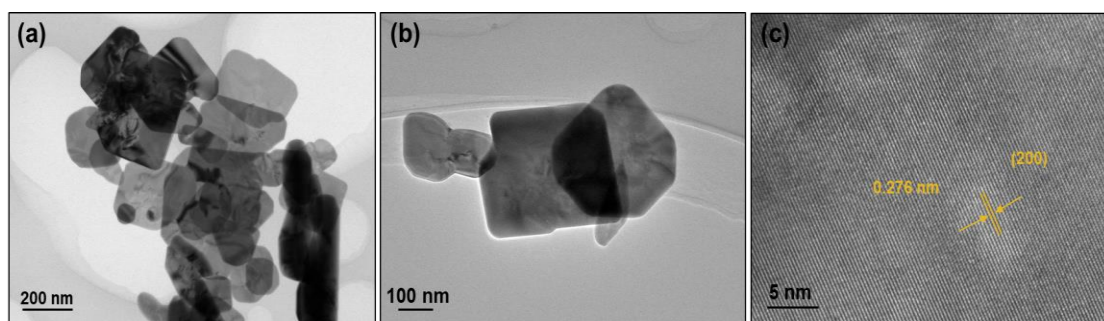**Fig. S2** AFM image of the pristine MXene nanosheets

Fig. S3 a, b TEM images, **c** HRTEM image of the pristine Bi_2MoO_6 nanoplates

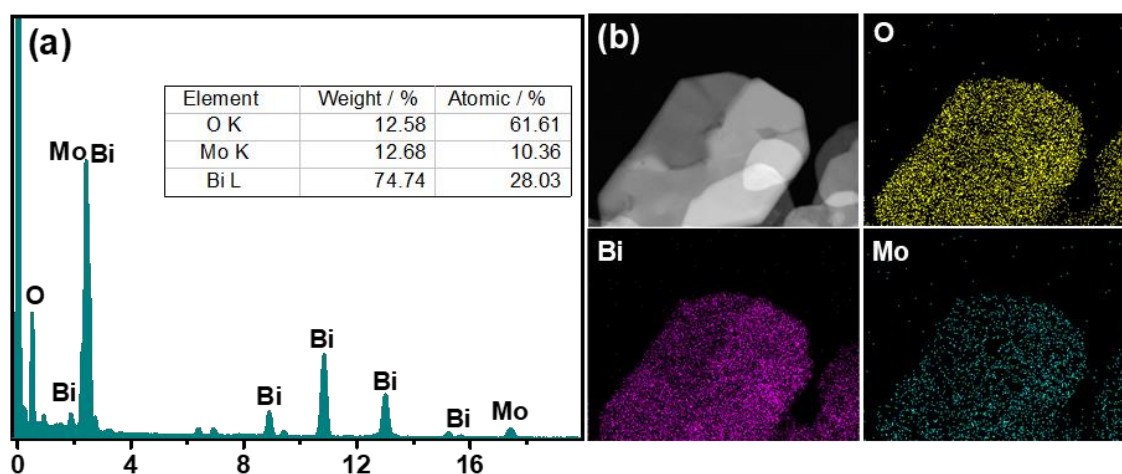| Element	Weight / %	Atomic / %
O K	12.58	61.61
Mo K	12.68	10.36
Bi L	74.74	28.03

Fig. S4 a EDS and **b** corresponding elemental mapping images of the Bi_2MoO_6 nanoplates
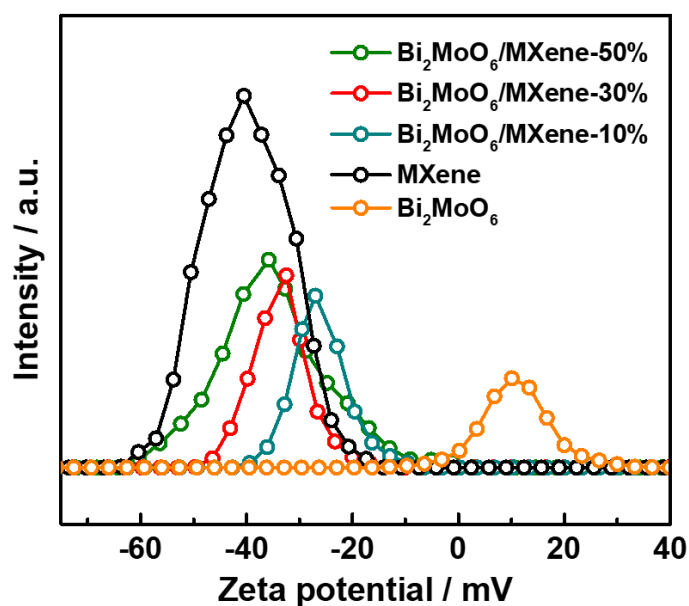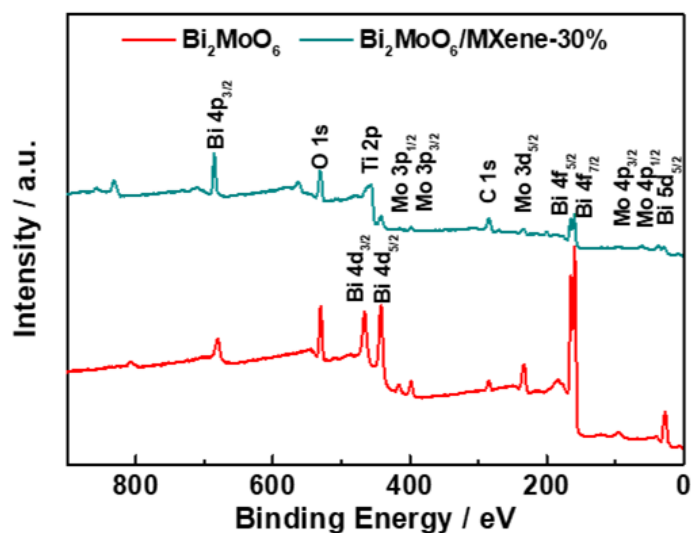

Fig. S5 Zeta potentials of the as-prepared samples
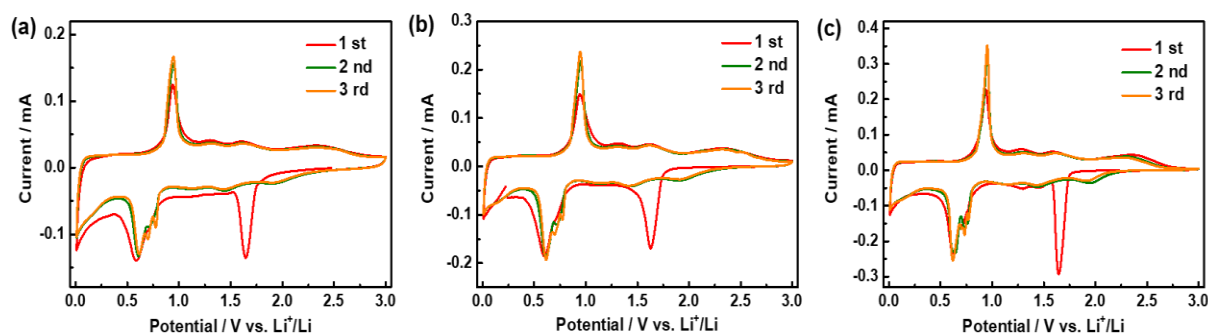
Fig. S6 XPS survey of Bi_2MoO_6/MXene-30% and Bi_2MoO_6

Fig. S7 CV curves of **a** Bi_2MoO_6/MXene-50%, **b** Bi_2MoO_6/MXene-10%, and **c** Bi_2MoO_6
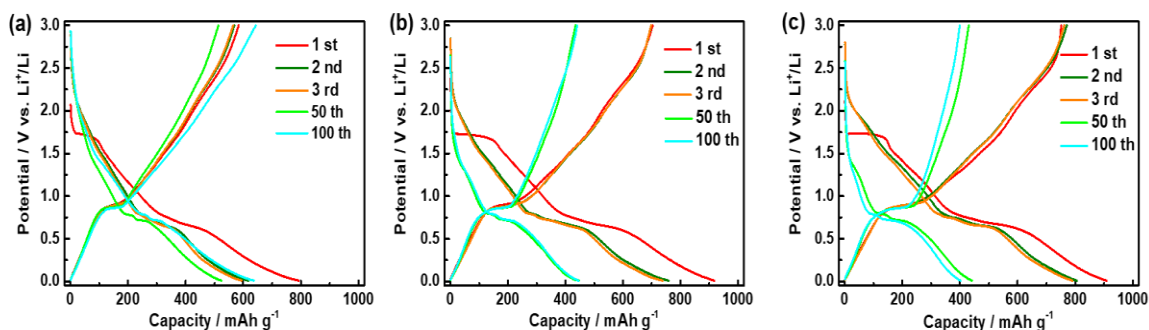

Fig. S8 Charge/discharge profiles of **a** Bi_2MoO_6/MXene-50%, **b** Bi_2MoO_6/MXene-10%, and **c** Bi_2MoO_6
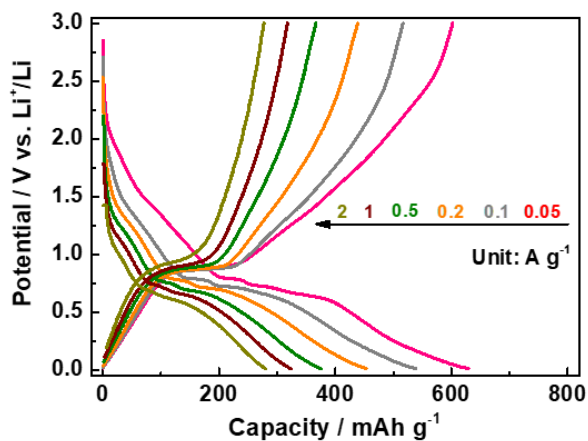
Fig. S9 Charge/discharge profiles of the Bi$_2$MoO$_6$ electrode at different current rates
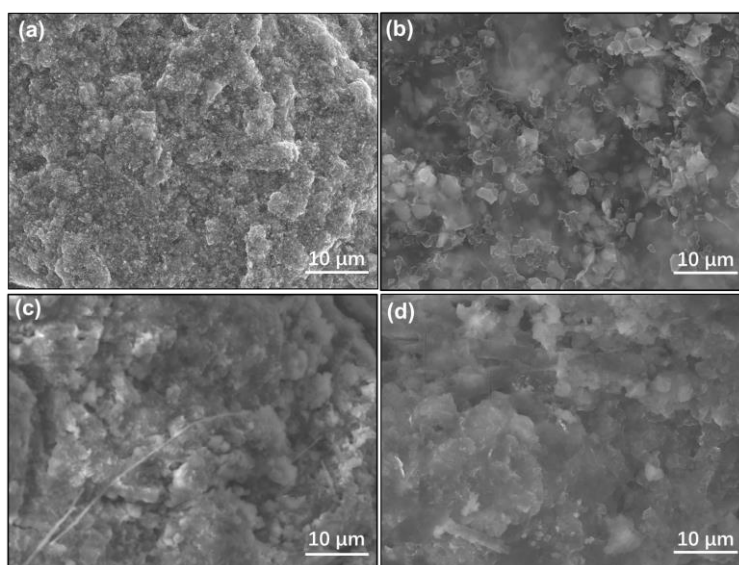

Fig. S10 SEM images of the Bi$_2$MoO$_6$/MXene-30% electrode: **a, b** before cycling; **c, d** after 1000 cycles at 1 A g^{-1}
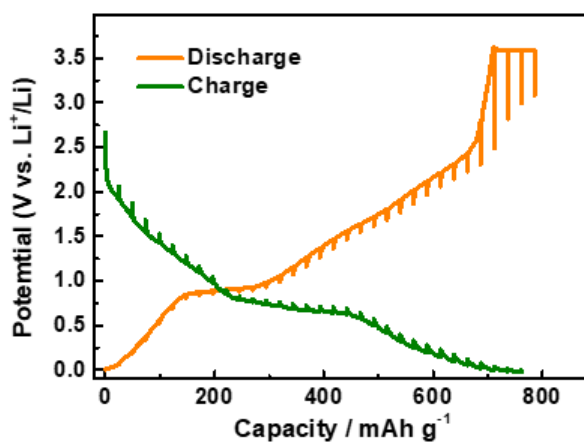

Fig. S11 GITT profiles of the Bi$_2$MoO$_6$ (current pulse at 100 mA g^{-1} for 30 min followed by 1 h relaxation)
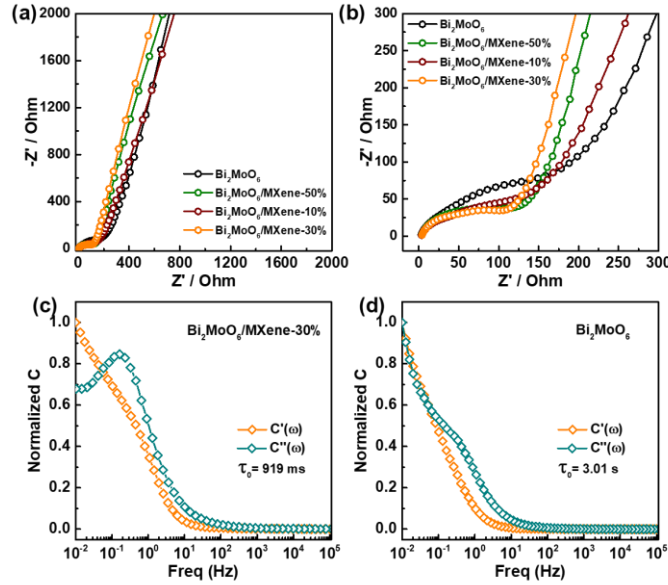
Fig. S12 a, b EIS spectra of the Bi_2MoO_6/MXene-50%, Bi_2MoO_6/MXene-30%, Bi_2MoO_6/MXene-10%, and Bi_2MoO_6 electrodes. Normalized real and imaginary capacities of the **c** Bi_2MoO_6/MXene-30% and **d** Bi_2MoO_6 electrodes

The real $C'(\omega)$ and imaginary $C''(\omega)$ capacities could be calculated through Eqs. 1 and 2:

$$C'(\omega) = \frac{-Z''(\omega)}{\omega|Z(\omega)|^2} \qquad (1)$$

$$C''(\omega) = \frac{Z''(\omega)}{\omega|Z(\omega)|^2} \qquad (2)$$

where $Z'(\omega)$ and $Z''(\omega)$ are the real and imaginary parts of the complex impedance $Z(\omega)$, respectively. The angular frequency (ω) is calculated by $\omega = 2\pi f$.
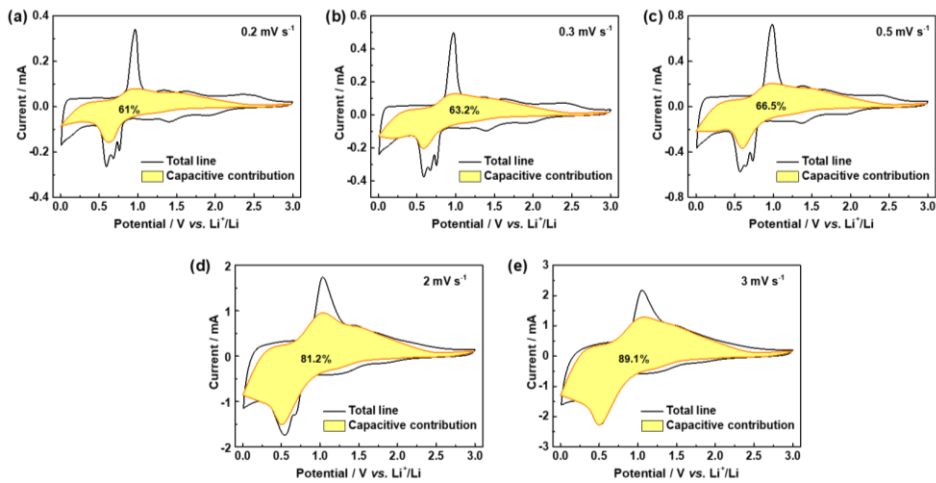

Fig. S13 CV profile measured at **a** 0.2 mV s^{-1}, **b** 0.3 mV s^{-1}, **c** 0.5 mV s^{-1}, **d** 2 mV s^{-1}, and **e** 3 mV s^{-1} with shaped area displaying the capacitive contribution

Table S1 Fitting EIS data of the as-prepared samples

	Bi_2MoO_6/MXene-50%	Bi_2MoO_6/MXene-30%	Bi_2MoO_6/MXene-10%	Bi_2MoO_6
R_s/Ω	3.49	3.08	3.76	4.18
R_{ct}/Ω	115.8	105.9	121.0	148.9