

Supporting Information

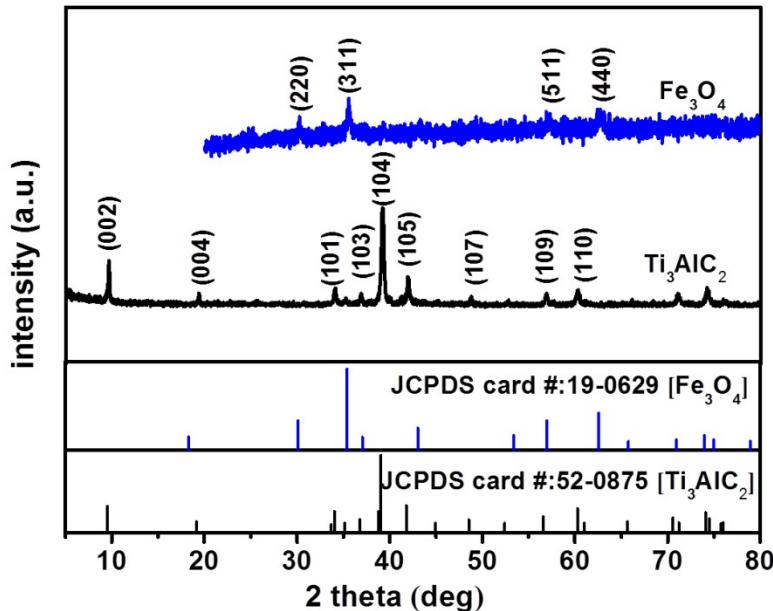


Fig. S1 XRD patterns of Ti_3AlC_2 and Fe_3O_4 .

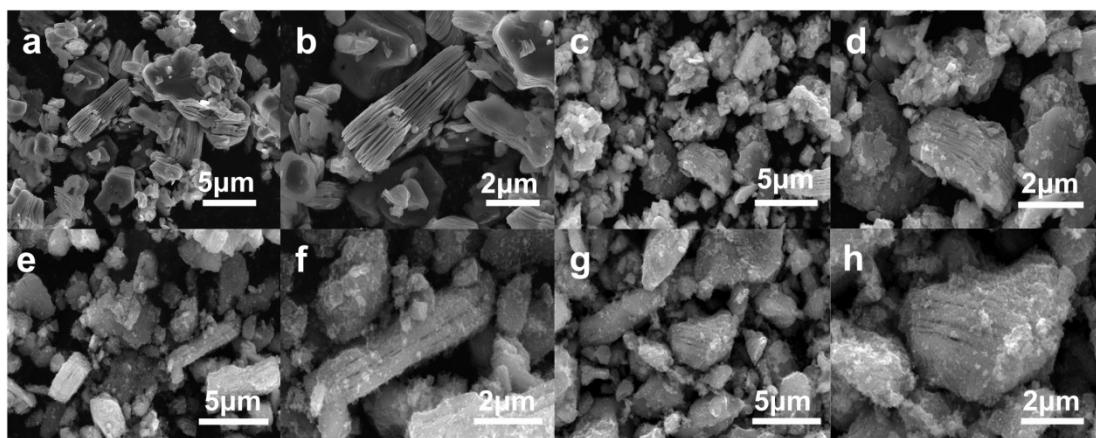


Fig. S2 SEM images of (a, b) Ti_3C_2 MXene, (c, d) Fe_3O_4 @ Ti_3C_2 -1:5, (e, f) Fe_3O_4 @ Ti_3C_2 -2:5 and (g, h) Fe_3O_4 @ Ti_3C_2 -1:1 samples.

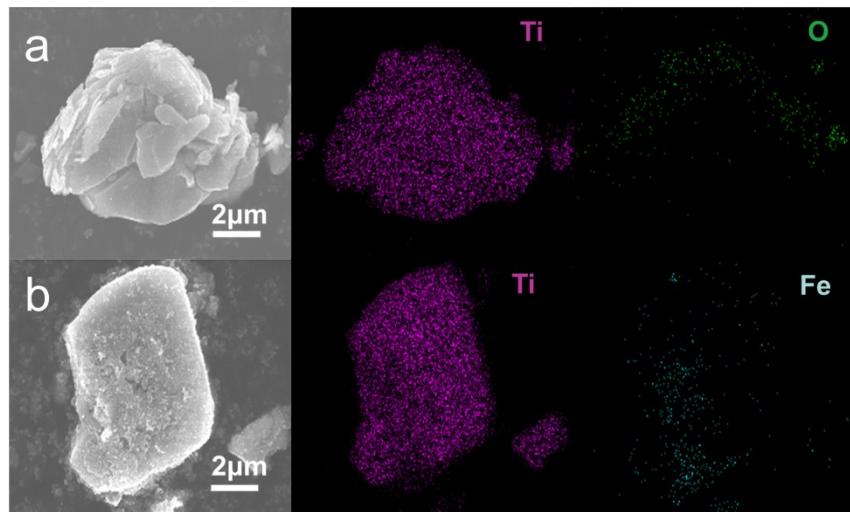


Fig. S3 (a) SEM image of Ti₃C₂ MXene and corresponding elemental mapping of Ti and O; (b) SEM image of Fe₃O₄@Ti₃C₂-2:5 sample and corresponding elemental mapping of Ti and Fe.

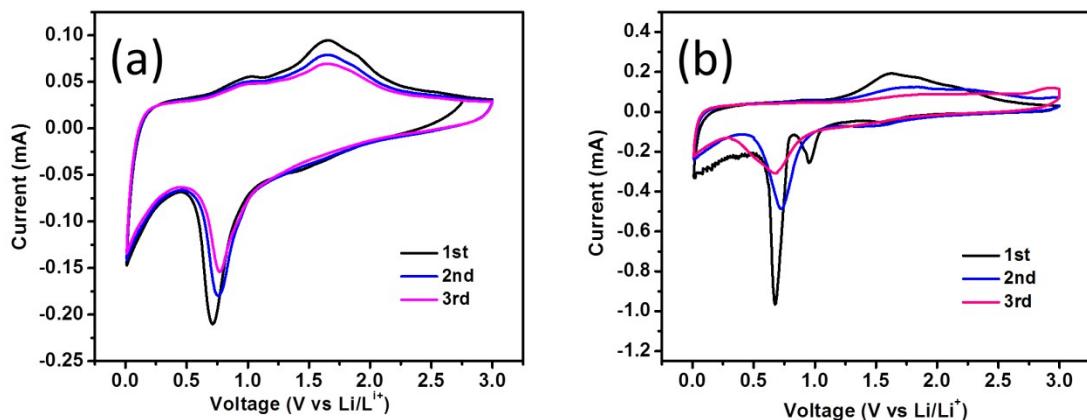


Fig. S4 CV curves of (a) Fe₃O₄@Ti₃C₂-1:5 and (b) Fe₃O₄@Ti₃C₂-1:1 electrodes from 3.0 V to 0.01 V vs. Li/Li⁺ at a scan rate of 0.2 mV s⁻¹.

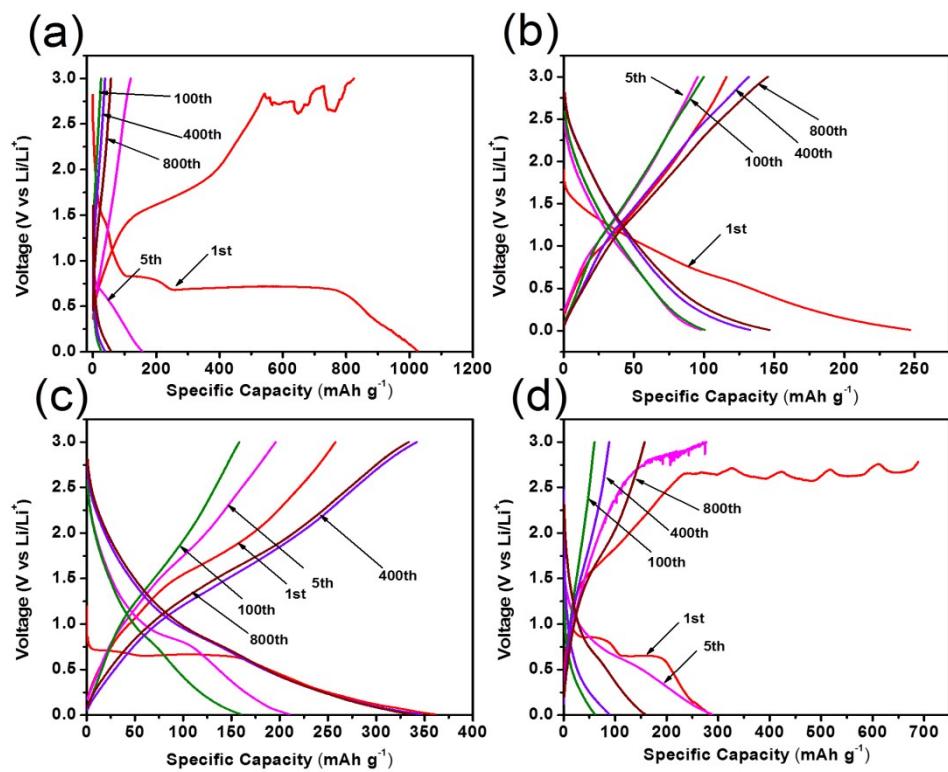


Fig. S5 charge-discharge profiles of (a) Fe_3O_4 , (b) Ti_3C_2 , (c) $\text{Fe}_3\text{O}_4@\text{Ti}_3\text{C}_2$ -1:5 and (d) $\text{Fe}_3\text{O}_4@\text{Ti}_3\text{C}_2$ -1:1 electrodes at 1C.

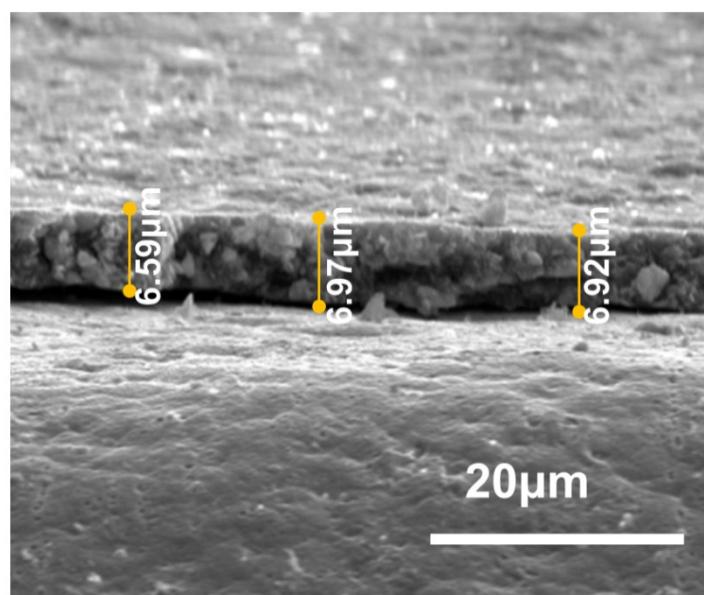


Fig. S6 Cross-sectional SEM image of $\text{Fe}_3\text{O}_4@\text{Ti}_3\text{C}_2$ -2:5 electrode before cycling.

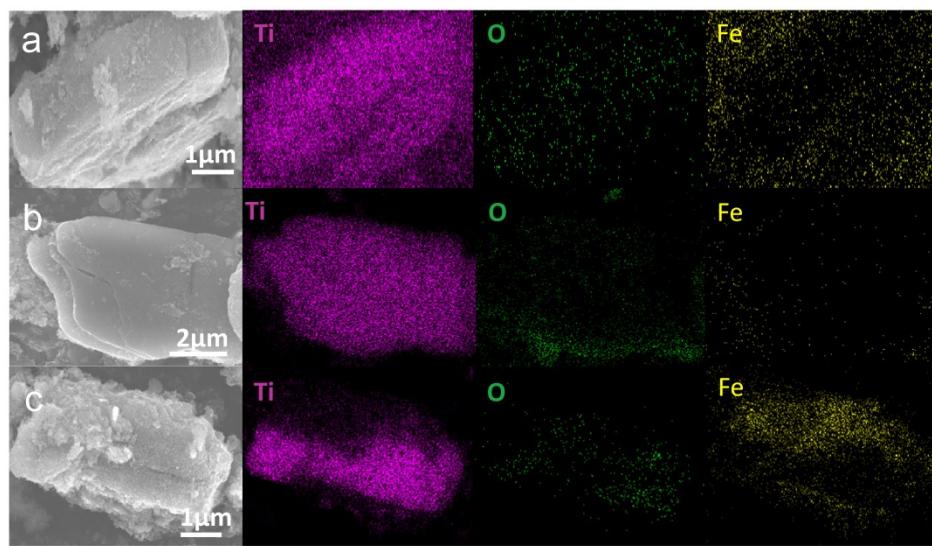


Fig. S7 SEM image of $\text{Fe}_3\text{O}_4@\text{Ti}_3\text{C}_2$ -2:5 hybrid electrodes and corresponding elemental mapping of Ti, O and Fe elements after (a) 30, (b) 300 and (c) 1000 cycles.