Supporting Information

Robust $LiTi_2(PO_4)_3$ Microflowers As High-rate and Long-life Cathodes for Mg-based Hybrid Ion Batteries

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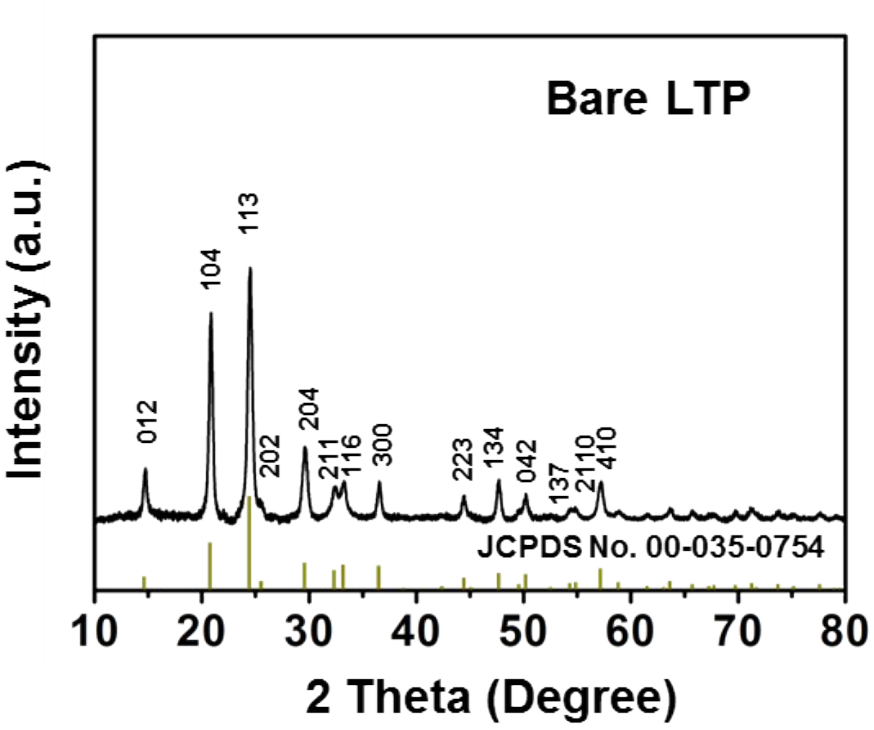

Fig. S1 The XRD pattern of bare LTP.

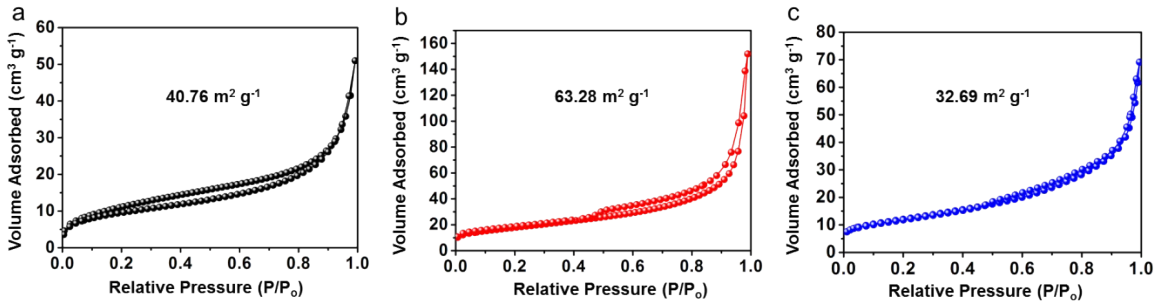

Fig. S2 Nitrogen adsorption-desorption isotherms of (a) LTP-F precursor, (b) LTP-F/C and (c) bare LTP.

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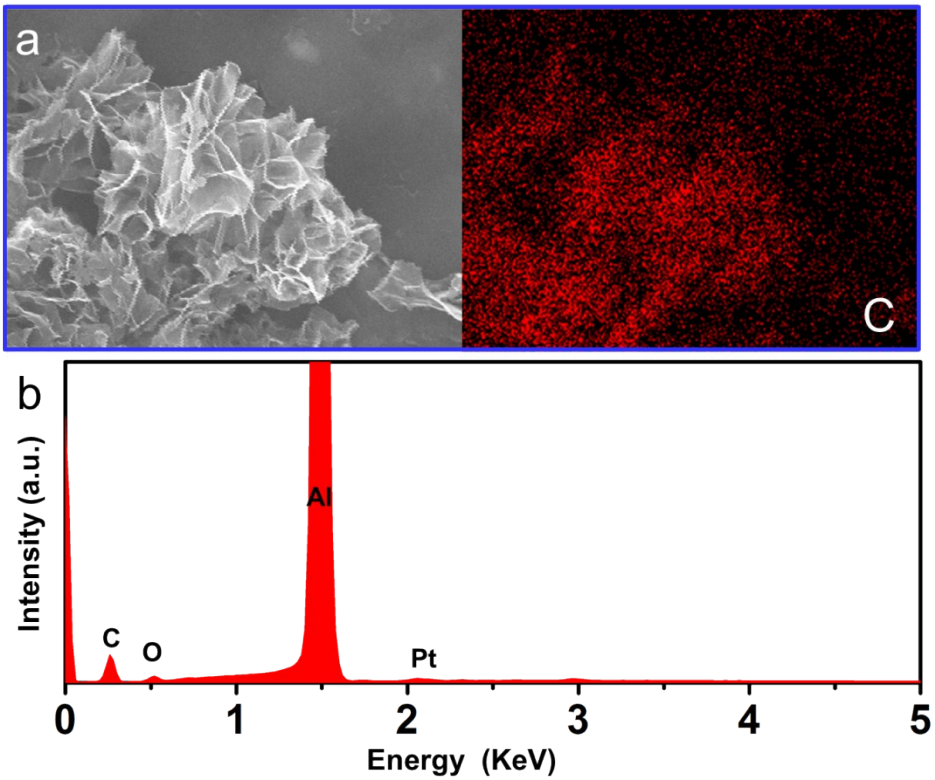

Fig. S3 (a) EDS elemental mappings, and (b) EDS spectrum of the residual carbon skeleton after etching the LTP from LTP-F/C.

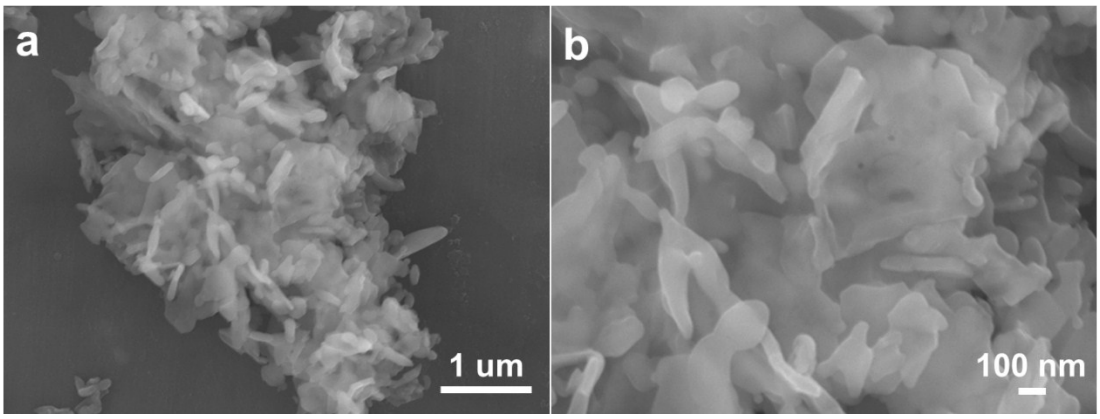

Fig. S4 (a, b) SEM images of the bare LTP.

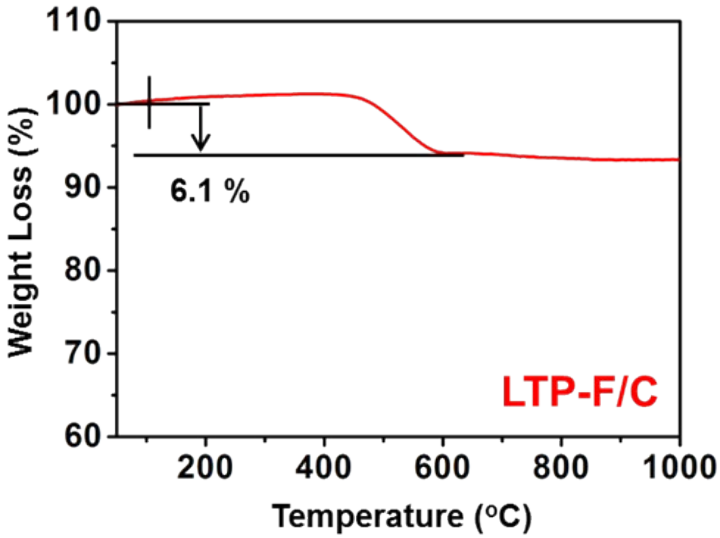

Fig. S5 TGA curve of LTP-F/C.

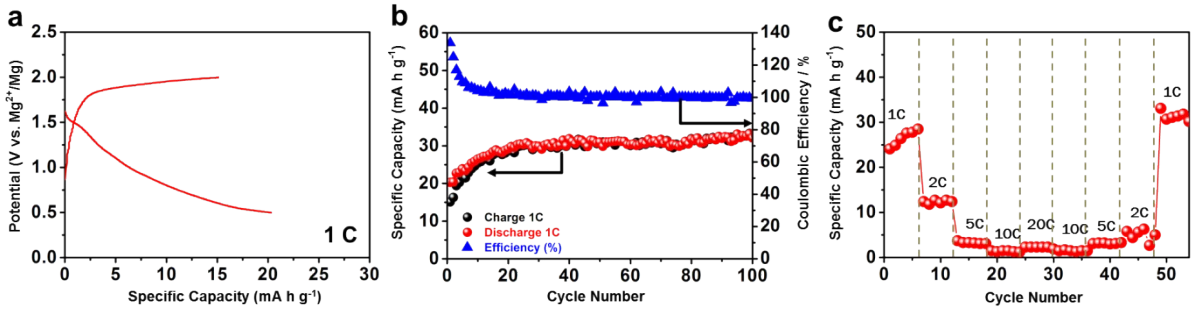

Fig. S6 (a) The initial discharge-charge curves and (b) cycling performances of bare LTP at 1 C.

(c) The rate performances of bare LTP.

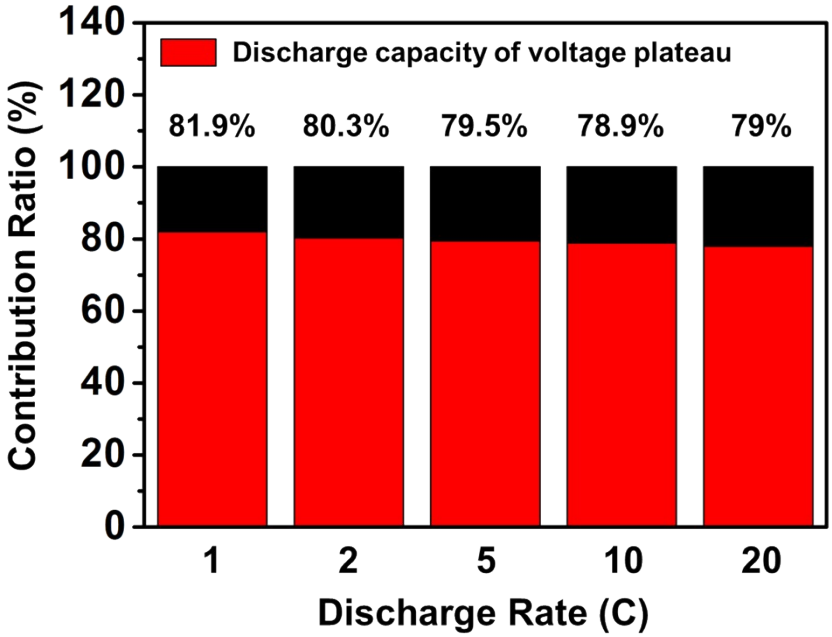

Fig. S7 Contribution ratio of plateau discharge capacity of LTP-F/C at different rates.

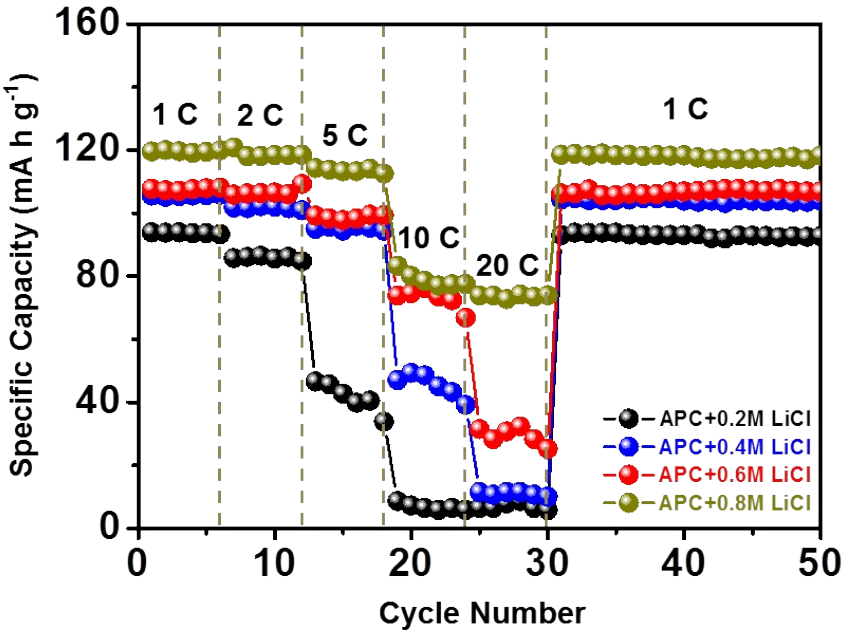

Fig. S8 Rate performances of LTP-F/C under different concentrations of LiCl.

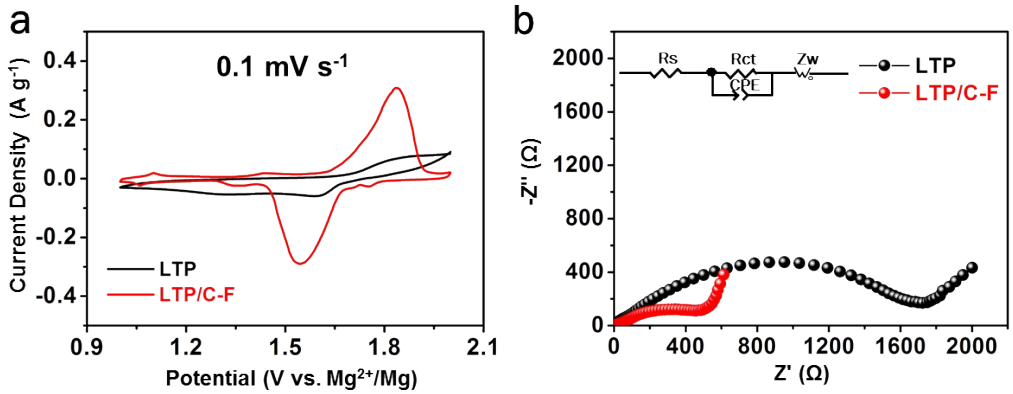

Fig. S9 (a) CV curves of LTP-F/C and bare LTP for the first cycle at a scanning rate of 0.1 mV s^{-1}. (b) The Nyquist plots of the LTP-F/C and bare LTP after two cycles with equivalent circuit inset.

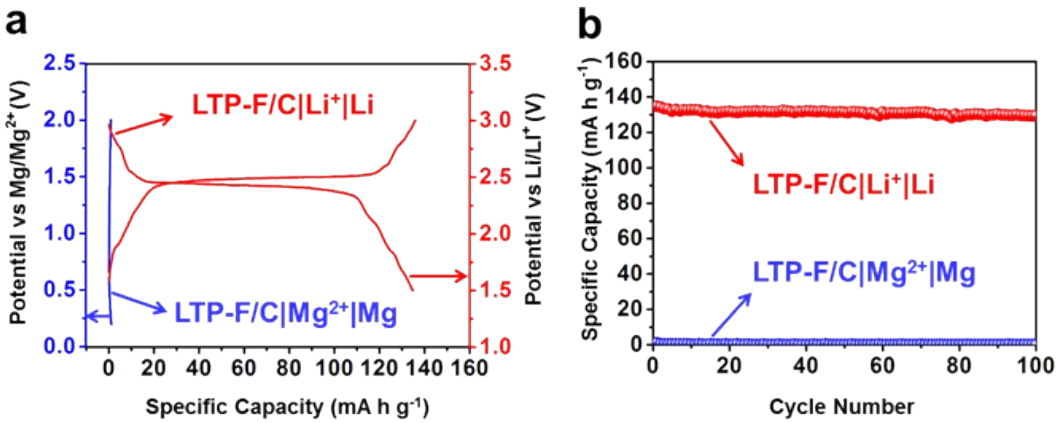

Fig. S10 (a) Discharge/charge curves of LTP-F/C cathode in the LTP-F/C|Mg^{2+}|Mg cell (1st cycle), LTP-F/C|Li^{+}|Li cell (1st cycle), at 1 C (1 C = 140 mA h g^{-1}) and (b) correspongding cycling performances.

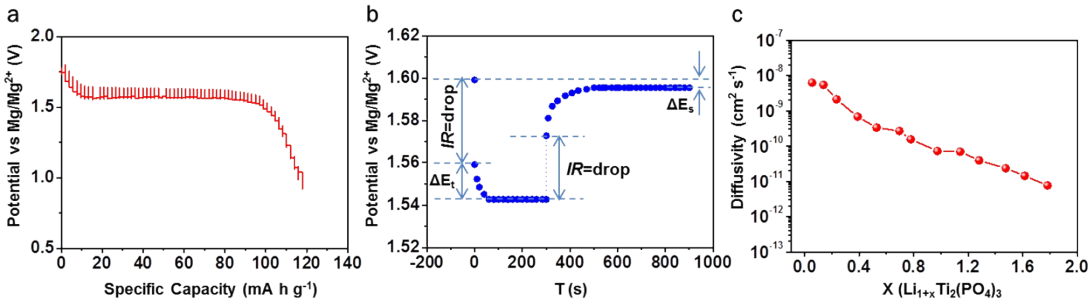

Fig. S11 (a) GITT curve of LTP-F/C at 1.0-2.0 V, (b) GITT potential response curve with time. The experiment was carried out at constant current pulse of 50 mA g^{-1} for 5 min followed by a relaxation period of 10 min and avoltage range.(c) Diffusivity versus state of discharge.

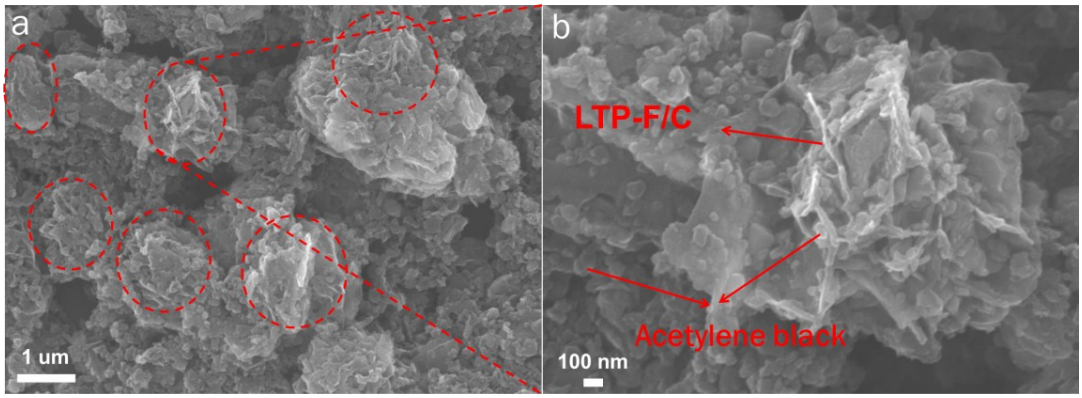

Fig. S12 (a, b) SEM images of the LTP-F/C electrode after 3000 cycles at 10 C.

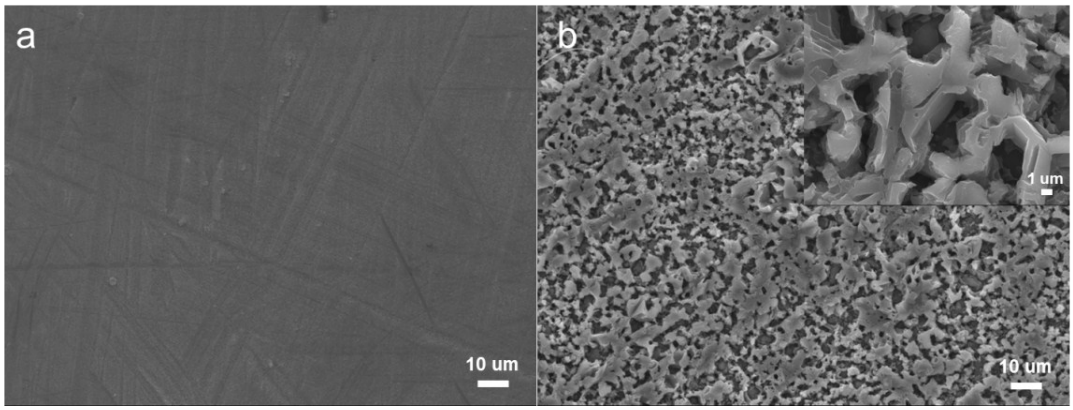

Fig. S13 SEM images of the Mg anode before cycling (a) and after 3000 cycles at 10 C (b).