Energy Materials

Supplementary Material

Tuning wettability of gallium-based liquid metal anode for lithium-ion battery via a metal mixing strategy

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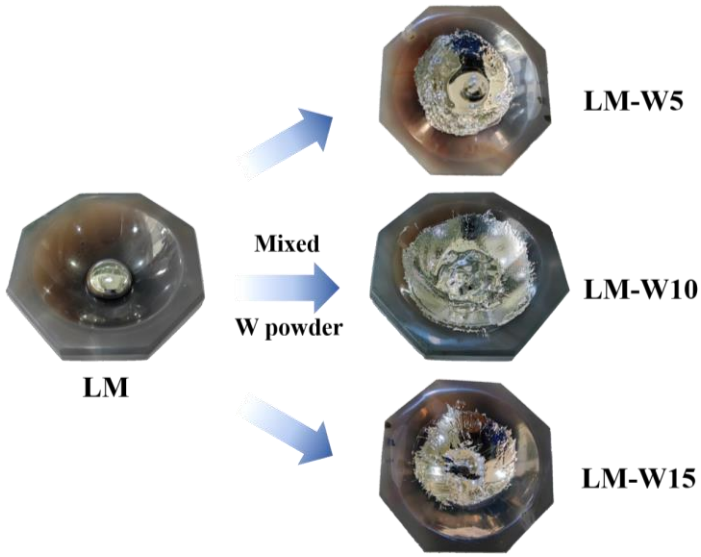


Figure S1. Digital photos of LM, LM-W5, LM-W10, and LM-W15.

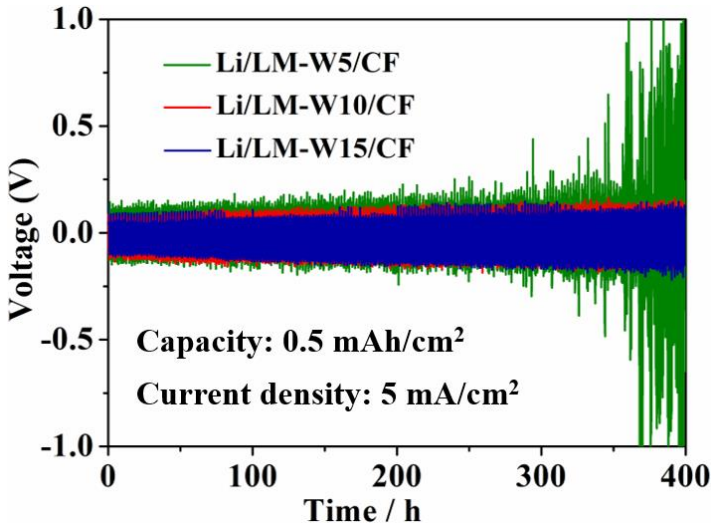


Figure S2. Electrochemical performance of the symmetric cells with Li/LM-W5/CF, Li/LM-W10/CF, and Li/LM-W15/CF.

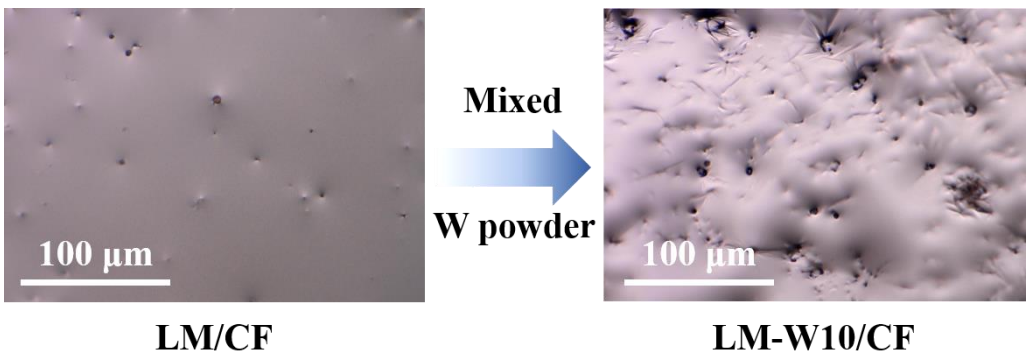


Figure S3. Optical images of the surface morphology changes.

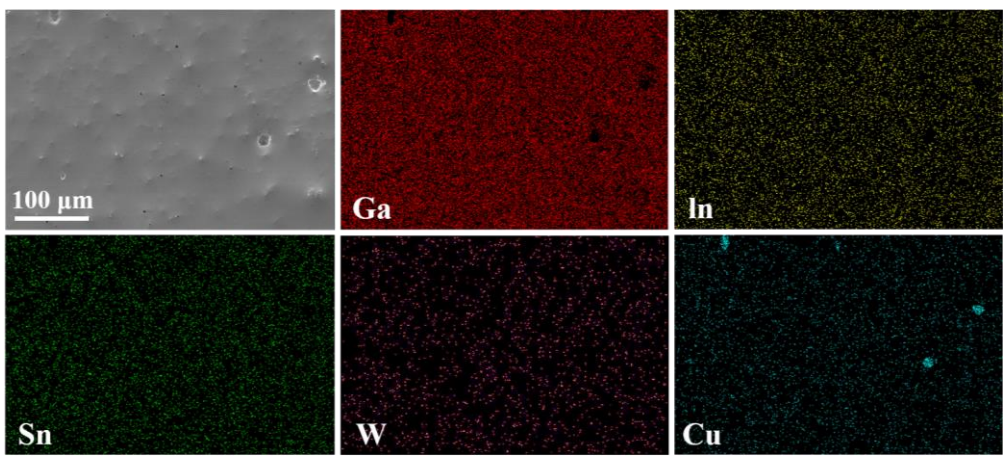


Figure S4. EDS mapping of the LM-W10/CF anode.

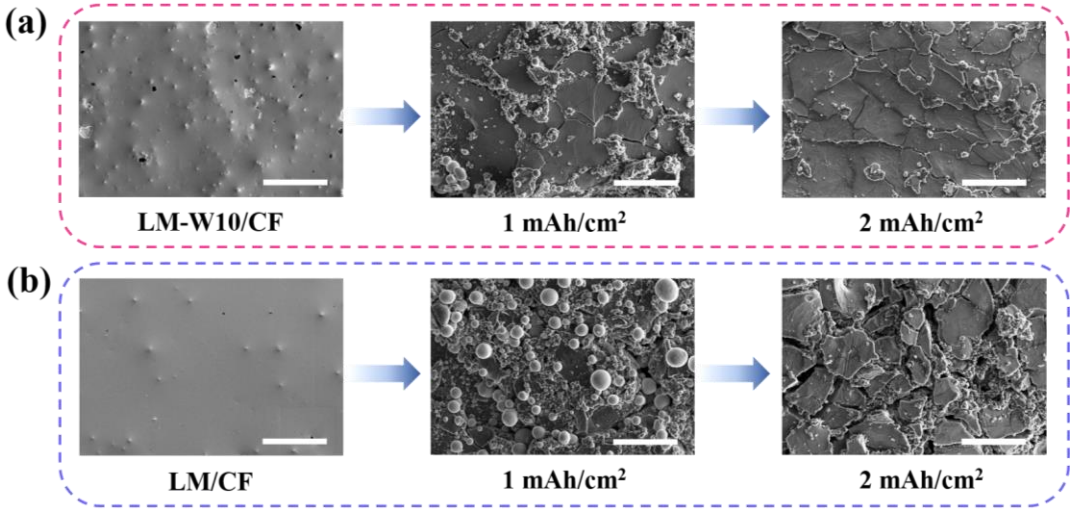


Figure S5. Scanning electron microscopy images of (a) LM-W10/CF and (b) LM/CF after lithiation at a 1 mA/cm^2 (scale bar 100 μm).

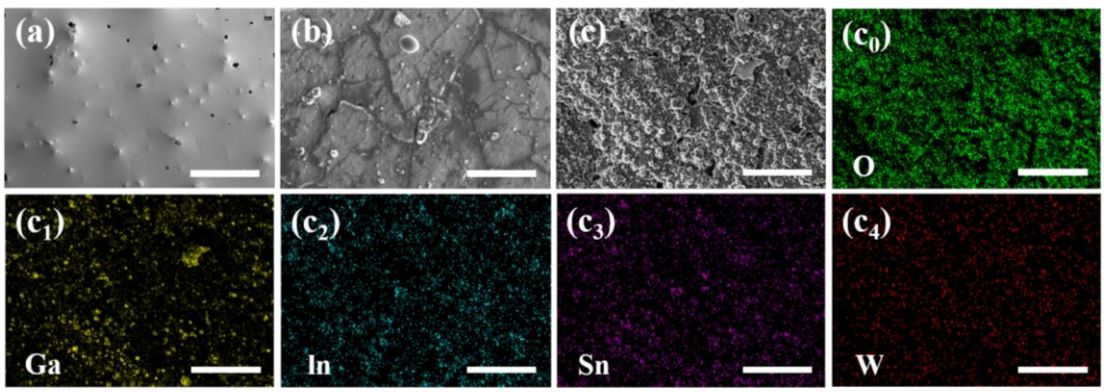


Figure S6. SEM images of the LM-W10/CF electrode (a) pristine; (b) lithiated; (c) delithiated; (c_0-c_4) EDS mapping of delithiated LM-W10/CF electrode in (c) (scale bar 100 μm).

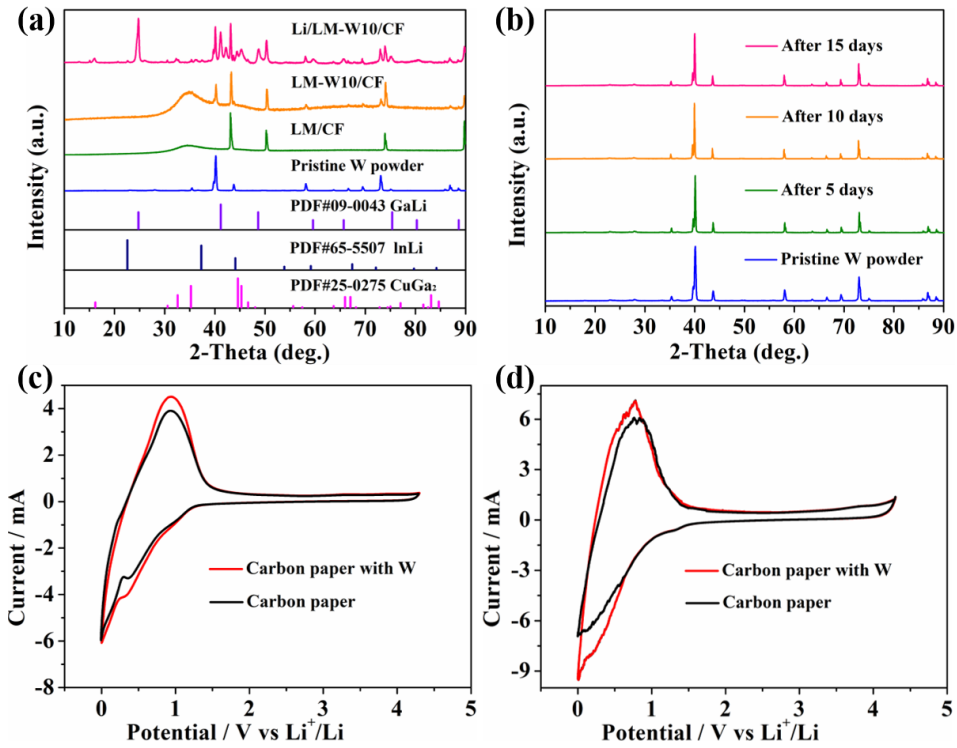


Figure S7. (a) XRD patterns of the LM/CF, LM-W10/CF and Li/LM-W10/CF electrodes; (b) XRD patterns of Nano-sized W powder immersed in electrolyte (without salts) for different time; the cyclic voltammetry of the carbon paper and the carbon paper with W powder in (c) 1 M $LiPF_6$ EC/DEC and (d) 1 M LiTFSI DOL/DME (1 wt.% $LiNO_3$) at 1 mV/s.

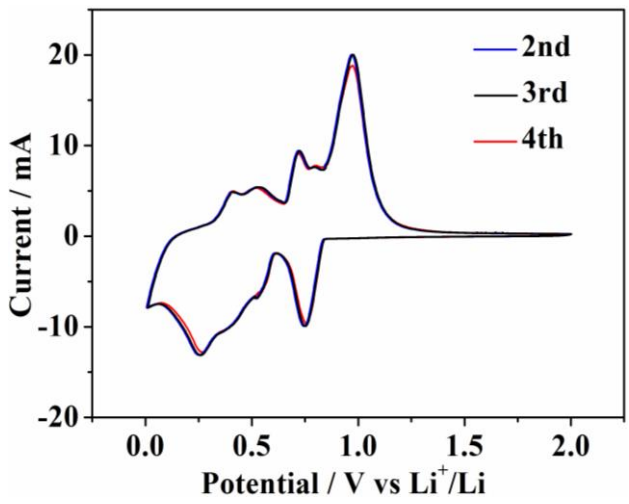
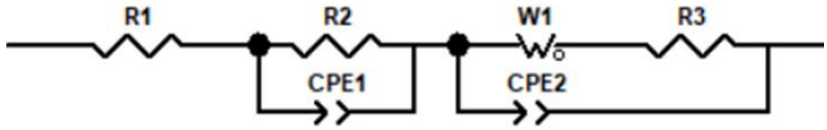


Figure S8. The CV curves of the LM-W10/CF anode at 0.5 mV/s.

(a)



Before Cycle	R1	R2	R3
LM/CF fresh	4.43 Ω	132.10 Ω	0.37 Ω
LM-W10/CF fresh	4.11 Ω	78.13 Ω	0.33 Ω

(b)

After Cycle	R1	R2	R3	R4
LM/CF 5th	7.86 Ω	157.50 Ω	87.47 Ω	294.30 Ω
LM-W10/CF 5th	4.09 Ω	15.86 Ω	42.42 Ω	28.13 Ω

Figure S9. Equivalent circuit models and resistance values of the LM/CF and LM-W10/CF (a) before and (b) after 5th cycling.

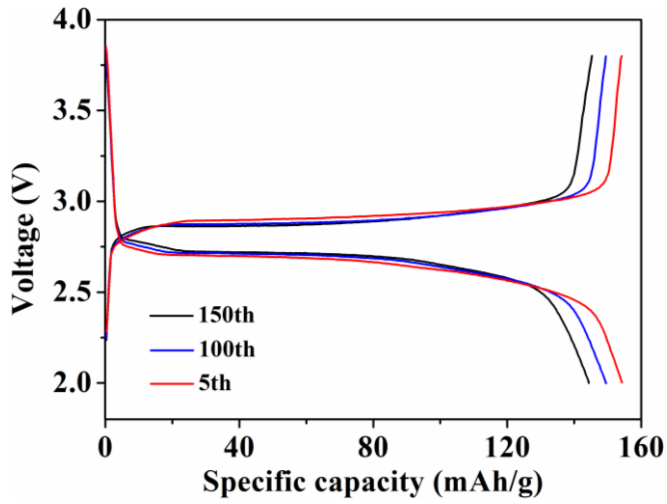


Figure S10. Galvanostatic charge/discharge profiles of the Li/LM-W10/CF||LFP full cell at different cycles.