

Lithium metal structural battery developed with vacuum bagging

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Table S1 Comparison of mechanical properties of structural batteries.*

	Tensile		Bending		Compression	
	Strength (MPa)	Modulus (GPa)	Strength (MPa)	Modulus (GPa)	Strength (MPa)	Modulus (GPa)
This work	168.4	4.65	157.8	10.3	38.4	5.8
Chen et al.[6]	293.4	12.8	180.8	4.4	22.2	5
Moyer et al.[10]	213	2	NA	NA	NA	NA
Asp et al.[3]	287	25.4	NA	NA	NA	NA
Asp et al.[3]	72	13.3	NA	NA	NA	NA
Jin et al.[35]	NA	NA	NA	3.1	NA	NA
Meng et al.[36]	270	7	NA	NA	NA	NA
Liu et al.[37]	NA	3.1	NA	NA	NA	NA

Note: NA represents not available.

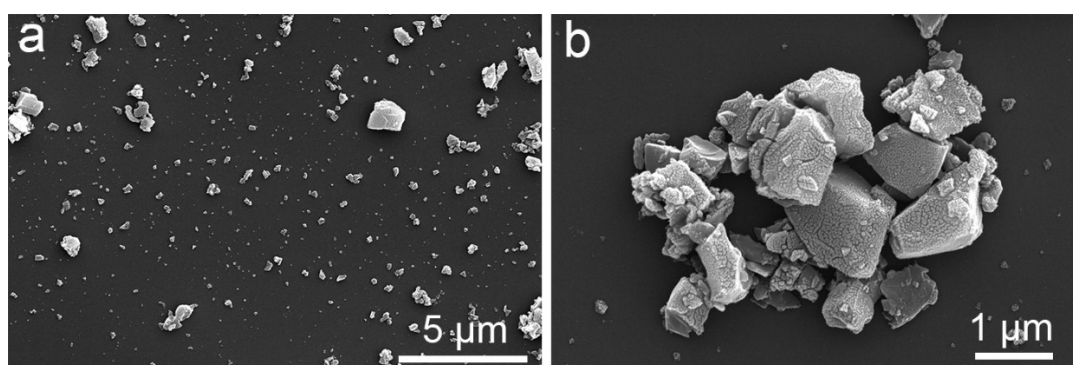


Fig. S1 The SEM images of LATP particles.

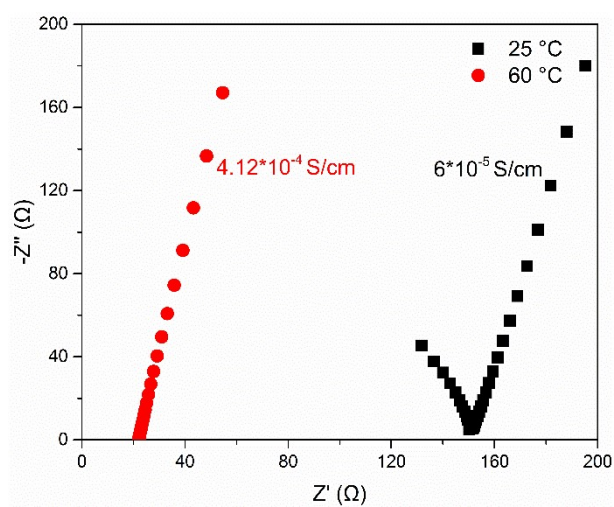


Fig. S2 Ionic conductivity of GFWF/PEO electrolyte.

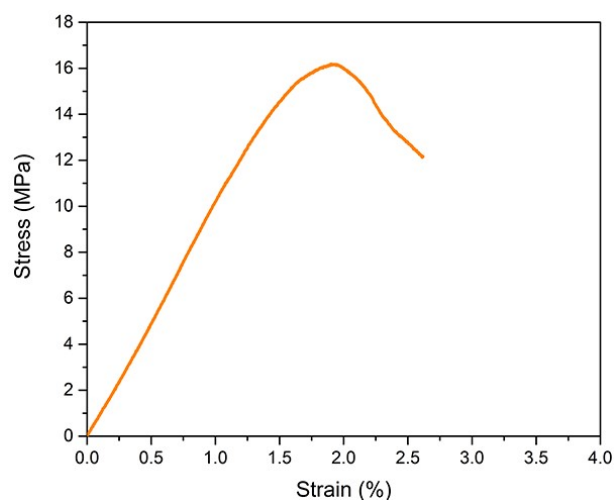


Fig. S3 Typical tensile stress-strain curve of GFWF/PEO electrolyte.

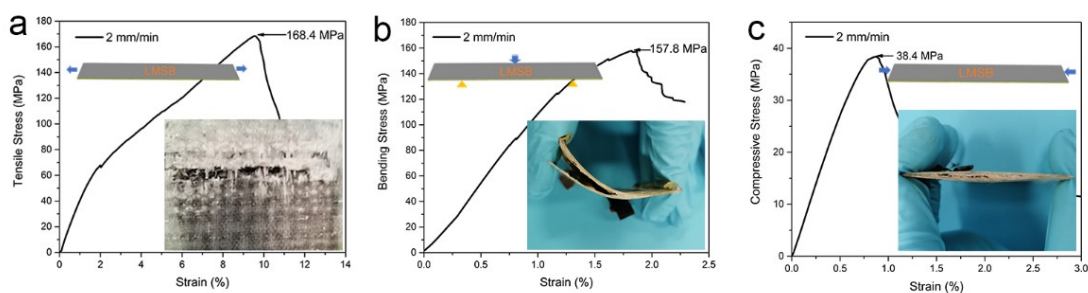


Fig. S4 Typical stress-strain curves of LMSB after applied with (a) tensile, (b) three-point bending and (c) compression along X-axis.

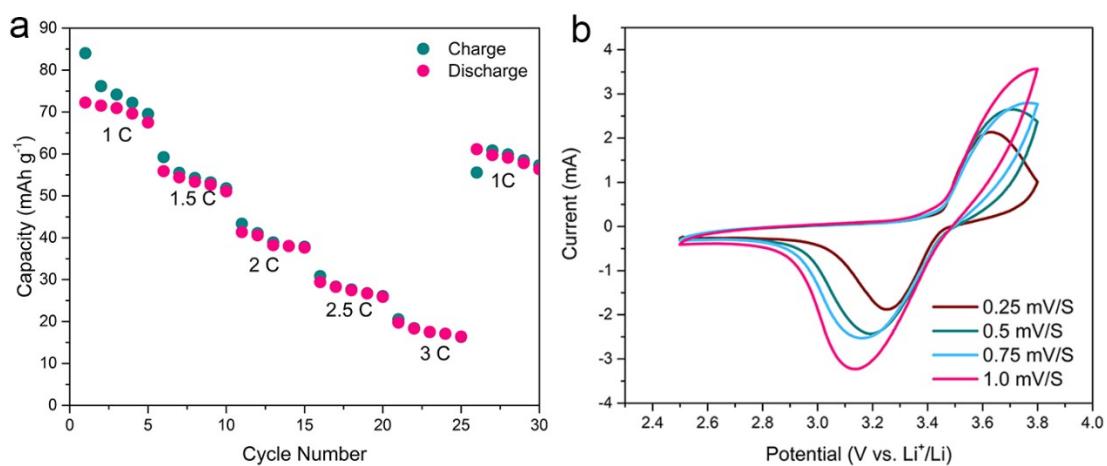


Fig. S5 (a) Rate performance of LMSB at 1-3 C. (b) Cyclic voltammetry of LMSB at 0.25-1 mV s⁻¹. The tested temperature is 60 °C.

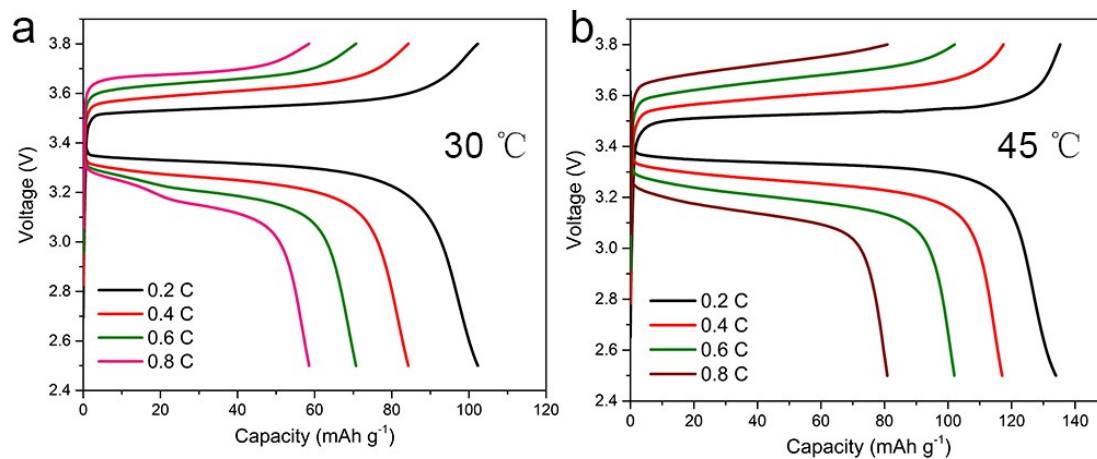


Fig. S6 Charge-discharge curves of LMSB at (a) 30 °C and (b) 45 °C.

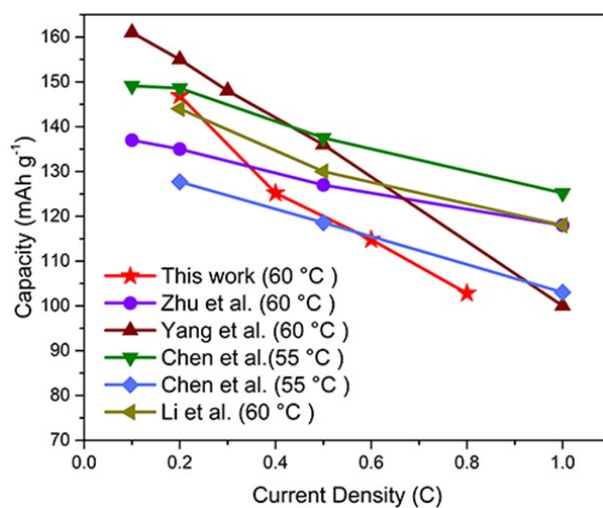


Fig. S7 Comparison of capacity between LMSB and previously reported traditional Li/PEO-based polymer electrolyte/LFP batteries [25,31,33,34].

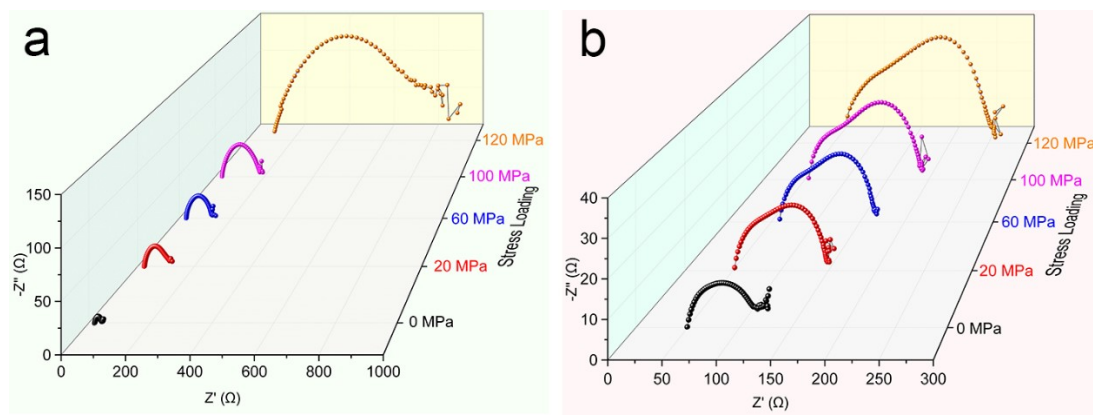


Fig. S8 Electrochemical impedance of LMSB after applied with (a) bending with Li anode upward and (b) bending with LFP cathode upward.

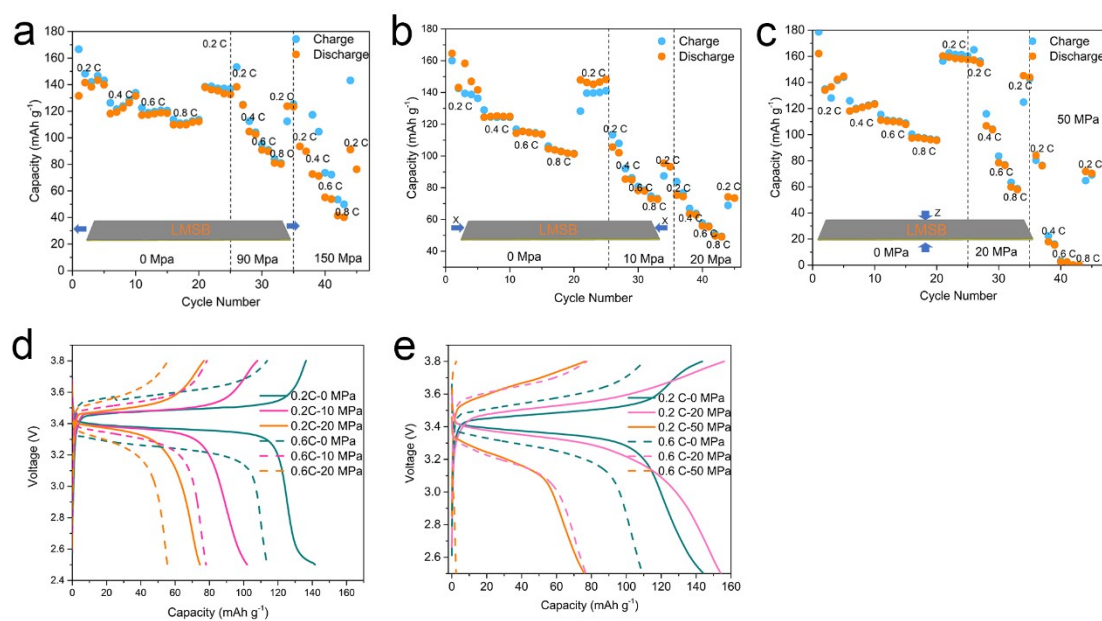


Fig. S9 Electrochemical capacity of LMSB after applied with (a) tensile stress, (b) compressive stress in X-axis and (c) compressive stress in Z-axis. Charge-discharge curves of LMSB after applied with (d) compressive stress in X-axis and (e) compressive stress in Z-axis.

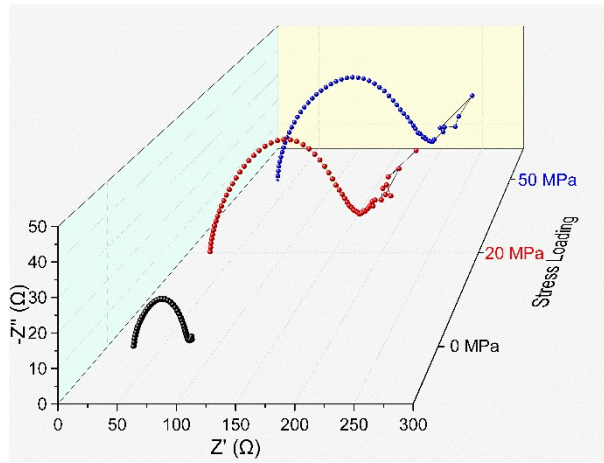


Fig. S10 Electrochemical impedance of LMSB after applied with compressive stress in Z-axis.