Electronic Supplementary Material (ESI) for Sustainable Energy & Fuels.

Supporting Information

Highly stable all-solid-state batteries with the Li-LTO composite anode

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$$\sigma = \frac{t}{R \times A} \qquad (S1)$$

where A is the area of the pellet, t is the cross-sectional thickness of the prepared pellet, and R is the resistance.

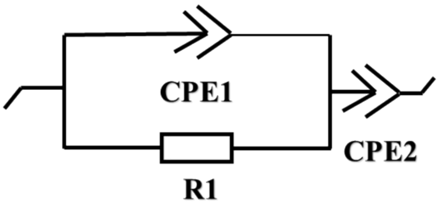

Fig. S1. Equivalent circuits corresponding to the LGLZO solid electrolyte.

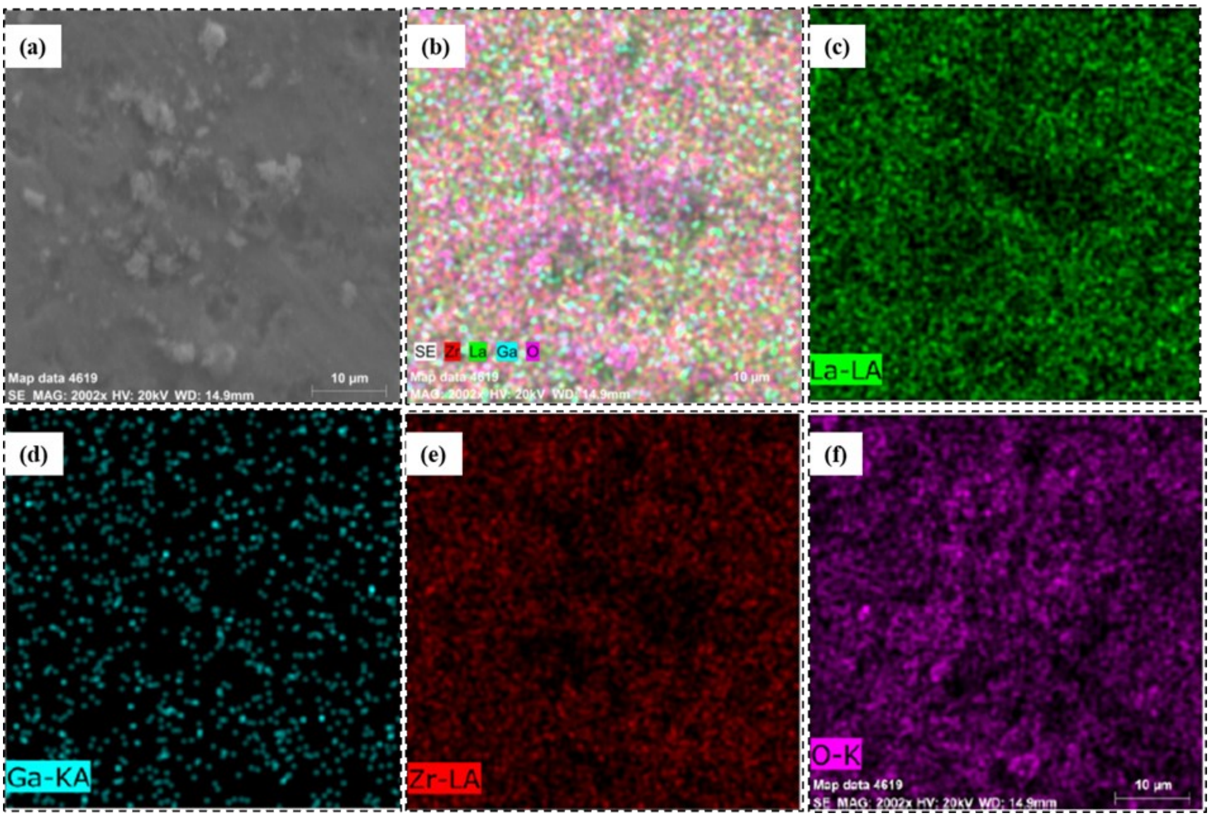

Fig. S2 (a) SEM image of prepared LGLZO solid electrolyte (b) elemental mapping image of LGLZO (c) La (d) Ga (e) Zr (f) O.

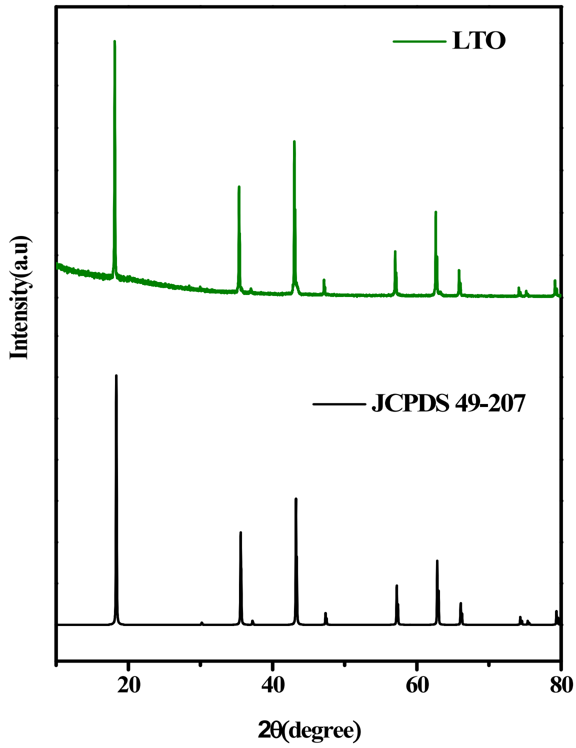

Fig. S3. XRD of prepared LTO Powder with JCPDS 49-207

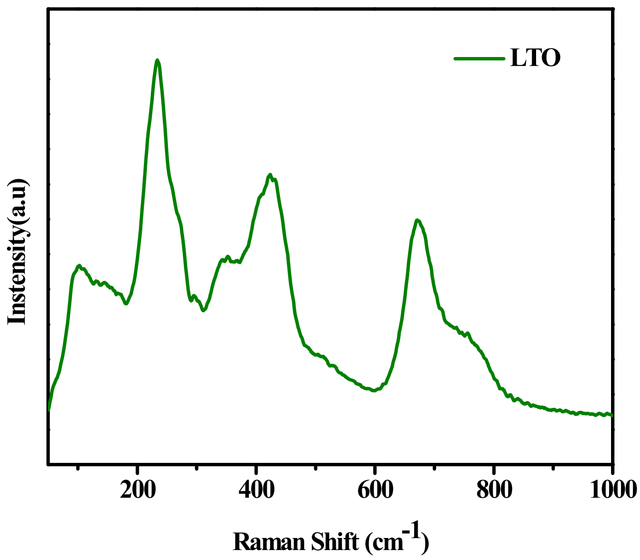

Fig. S4. Raman spectra of prepared LTO Powder

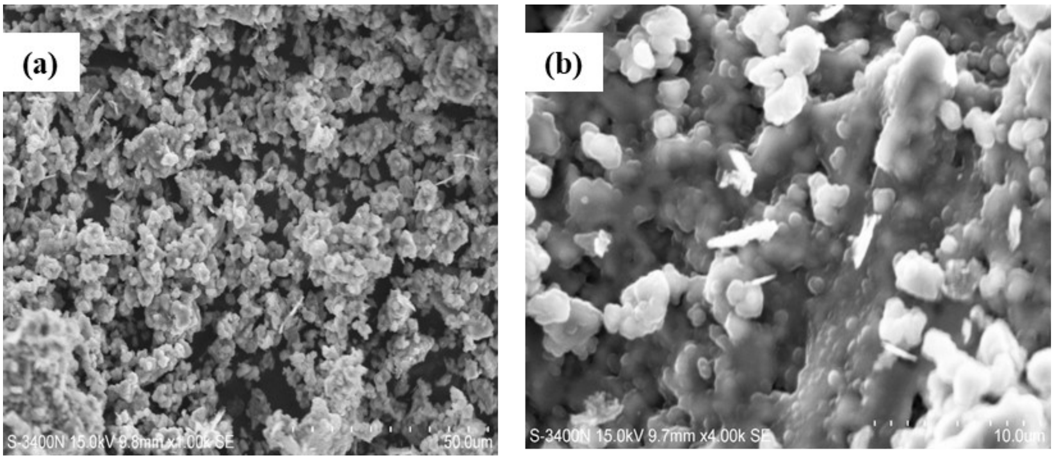

Fig. S5. (a and b) SEM of prepared LTO Powder at different magnifications.

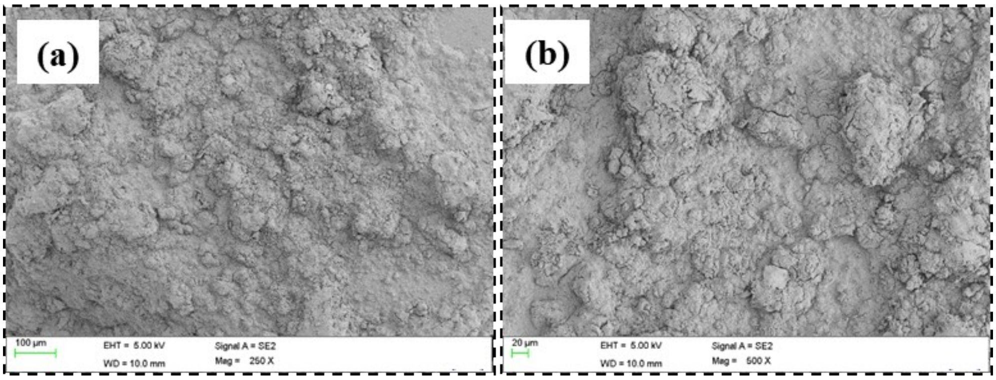

Fig. S6 (a and b) SEM image of Li-LTO composite at different magnitudes.

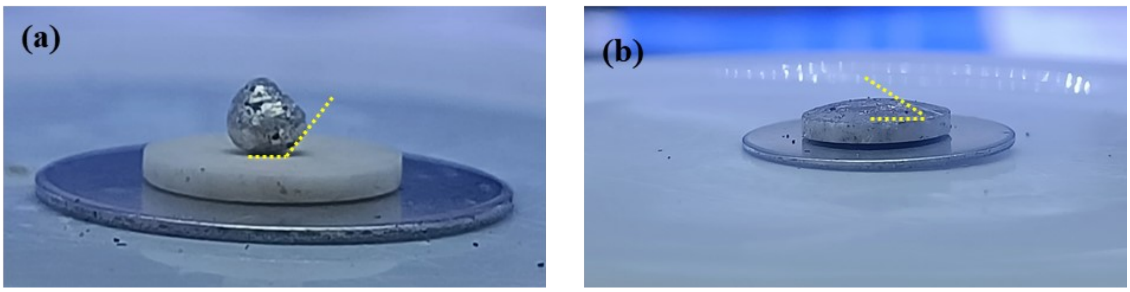

Fig S7 contact angles of the (a) molten Li (b) Li–LTO on LGLZO electrolyte

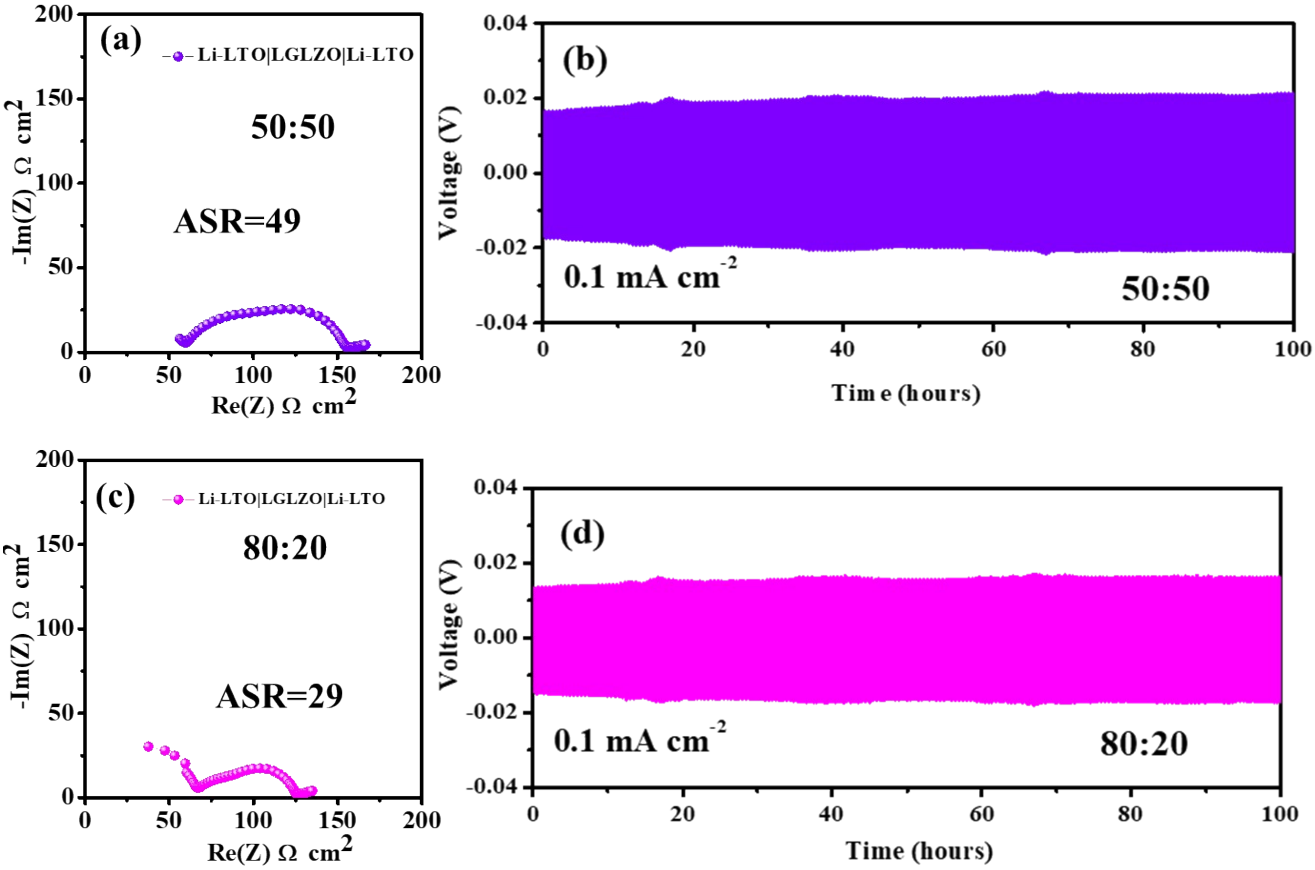

Fig S8. (a) Nyquist plot of Li-LTO|LGLZO|Li-LTO (50:50) (b) time-voltage profile of Li-LTO| LGLZO |Li-LTO (50:50) at 0.1 mA cm^{-2} current density. (c) Nyquist impedance plot of Li-LTO|LGLZO|Li-LTO (80:20) (d) time-voltage profile of Li-LTO| LGLZO |Li-LTO (80:20) at 0.1 mA cm^{-2} current density

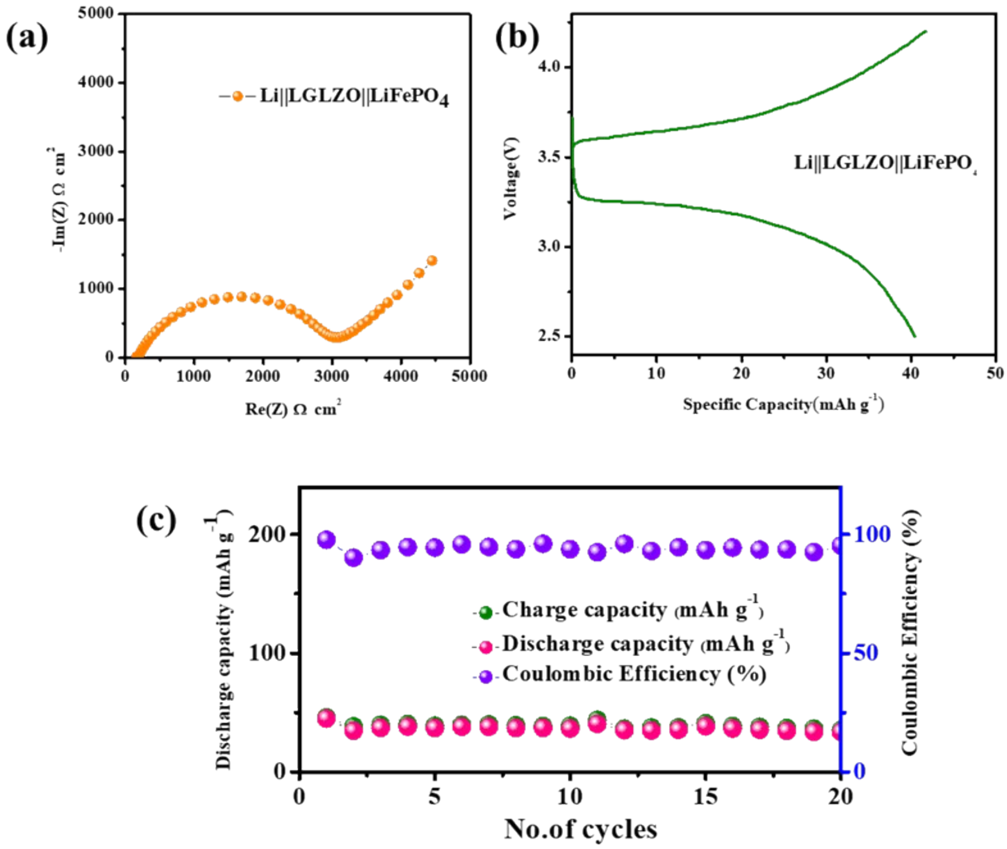

Fig. S9. (a) Impedance plot of Li|LGLZO|$LiFePO_4$ cell measured at ambient atmosphere (b) Galvanostatic charge-discharge profile of Li|LGLZO|$LiFePO_4$ from 4 to 2.5 V at ambient atmosphere (c) Long cycling performance of Li|LGLZO|$LiFePO_4$ with coulombic efficiency at ambient atmosphere.