Supporting information for

Enhancing Performance of Lithium Metal Batteries through Acoustic Field Application

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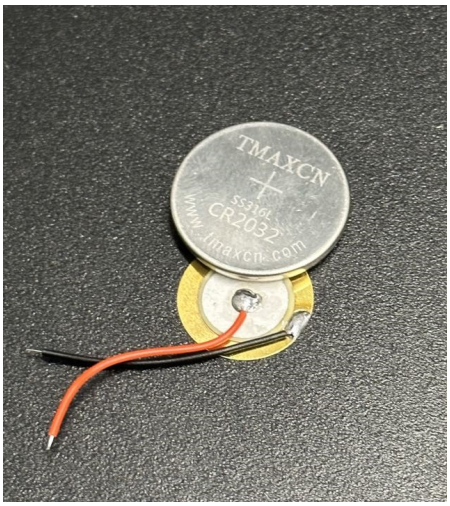

Figure S1. Photo of the test setup with a piezoelectric transducer and battery configuration.

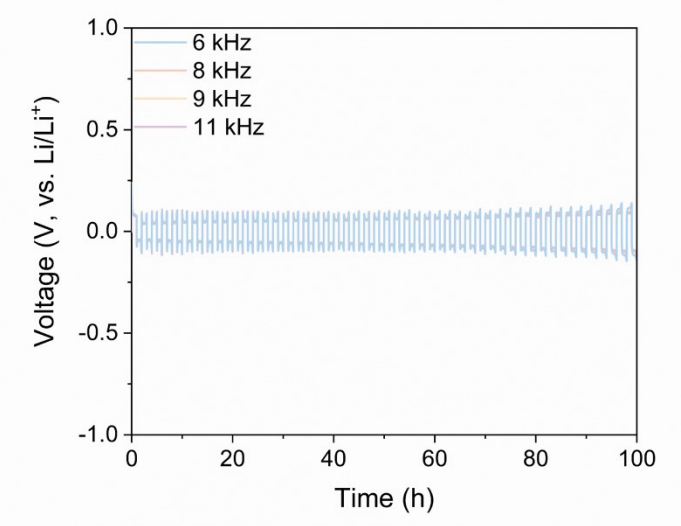

Figure S2. Voltage-time curves of Li | Li symmetrical coin cells at different frequencies.

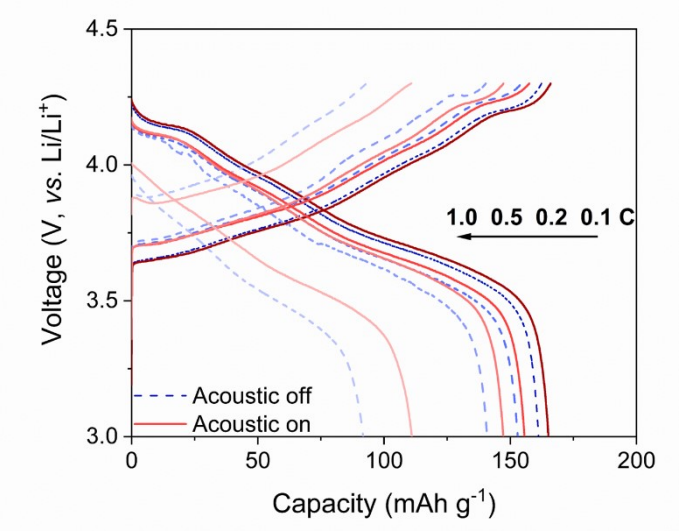

Figure S3. Comparative rate performance of the cells, with corresponding voltage profiles.

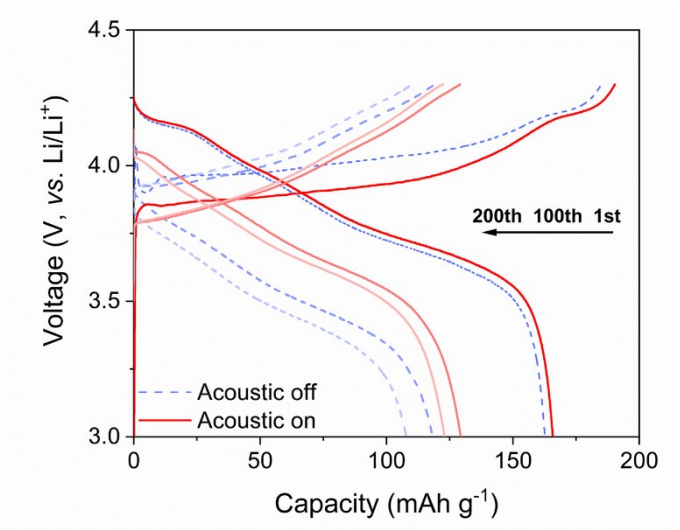

Figure S4. Voltage profiles associated with the cycling performance data.

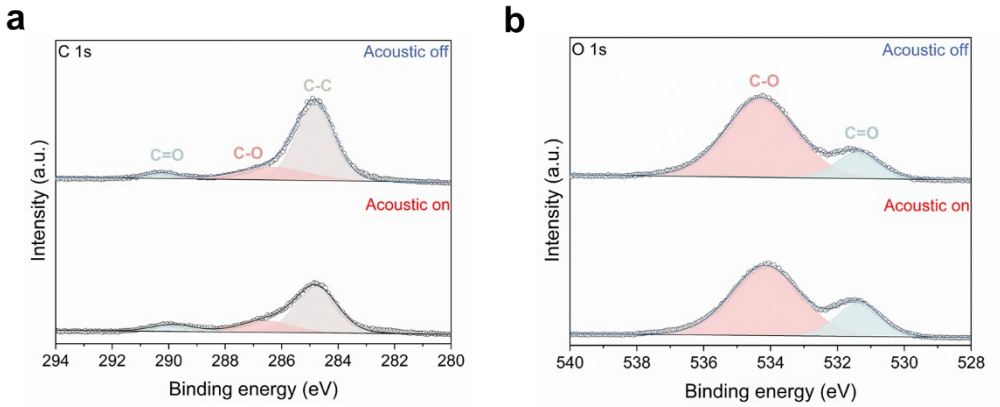

Figure S5. C 1s and O 1s spectra of the SEI film on lithium anodes surface after cycling.

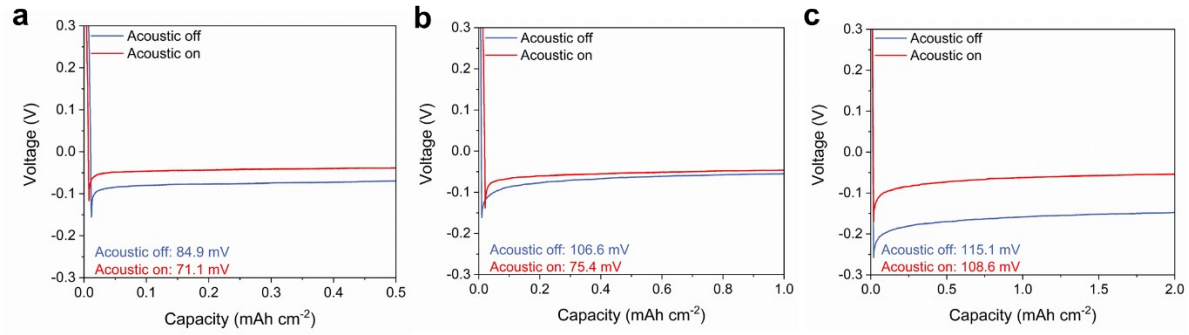

Figure S6. Comparison of nucleation overpotentials for Li | Cu cells with and without acoustics at current densities of 0.5 mA cm^{-2} (a), 1.0 mA cm^{-2} (b), and 2.0 mA cm^{-2} (c).

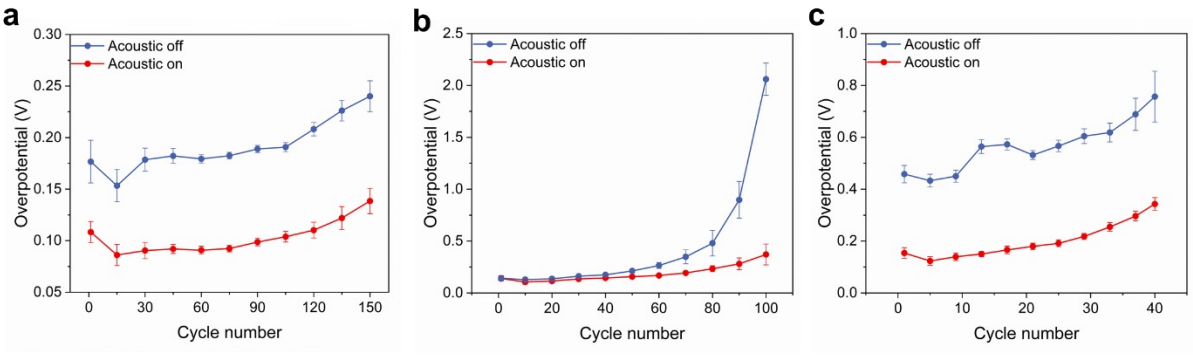

Figure S7. Overpotential-cycle number curves of Li | Li symmetrical batteries with and without an acoustic field at current densities of 0.5 mA cm^{-2} (a), 1.0 mA cm^{-2} (b), and 2.0 mA cm^{-2} (c).

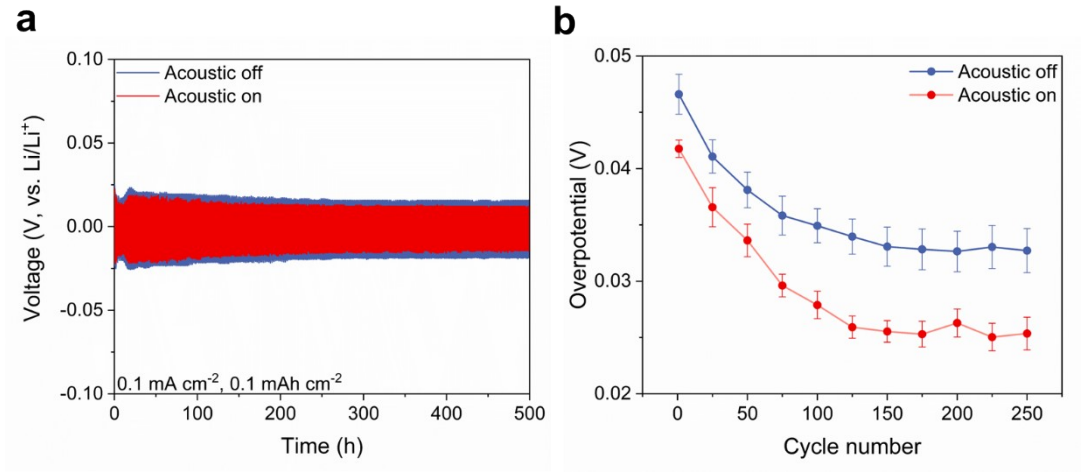

Figure S8. (a) Voltage-time and (b) overpotential-cycle number curves of Li | Li symmetrical coin cells at 0.1 mA cm^{-2}.

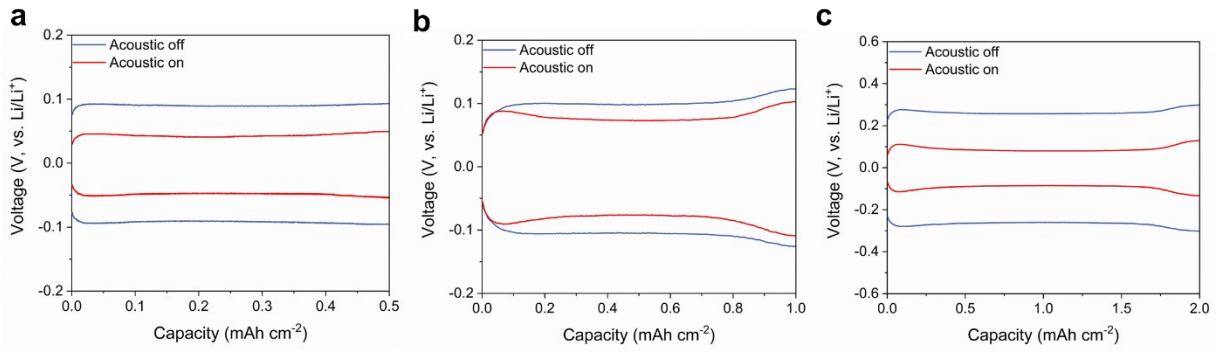

Figure S9. The voltage profiles of Li | Li symmetrical batteries w/o acoustics at current density of 0.5 mA cm^{-2} (a), 1.0 mA cm^{-2} (b), and 2.0 mA cm^{-2} (c).

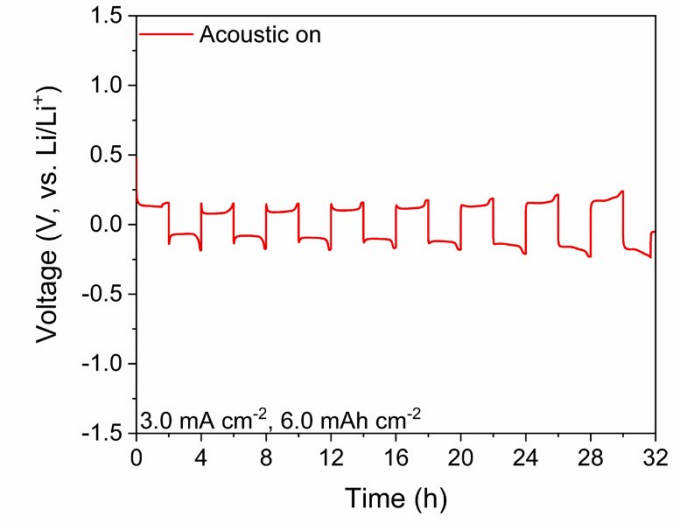

Figure S10. Voltage-time curves of Li | Li symmetrical coin cells at 3.0 mA cm^{-2} and an areal capacity of 6.0 mAh cm^{-2}.

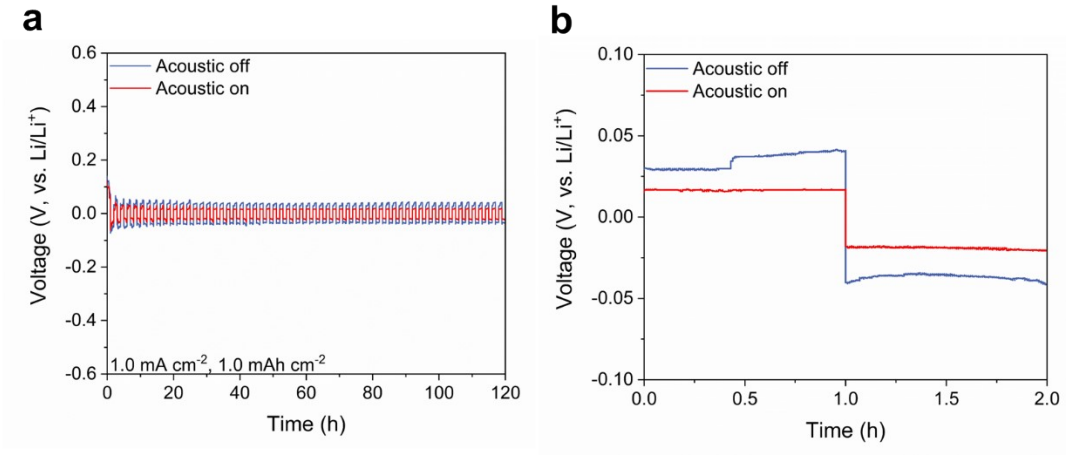

Figure S11. (a) Voltage-time curves of Li | Li symmetrical coin cells with DME/DOL electrolyte at 1.0 mA cm^{-2}, and (b) the corresponding overpotential-time curve.

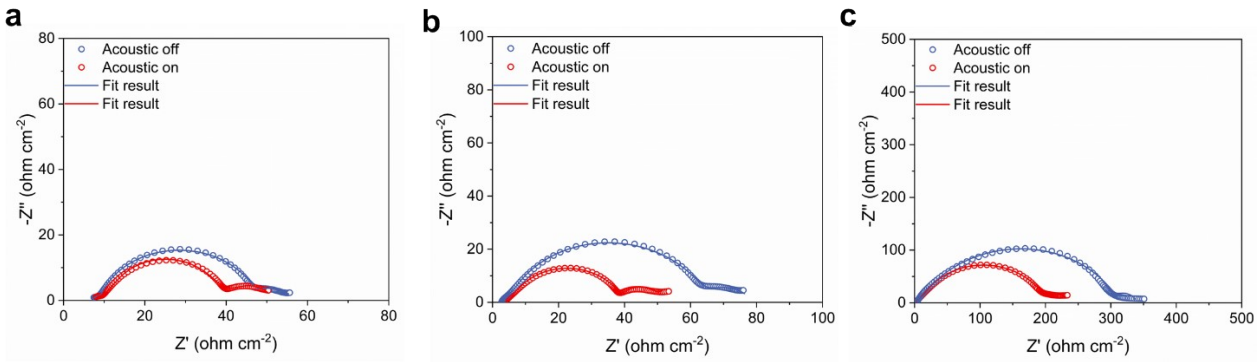

Figure S12. Electrochemical impedance spectroscopy (EIS) of symmetric Li cells after cycling w/o acoustics after cycling.