Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting information

The Impact of Residual Solvent on Catholyte Performance in Solid-State Batteries

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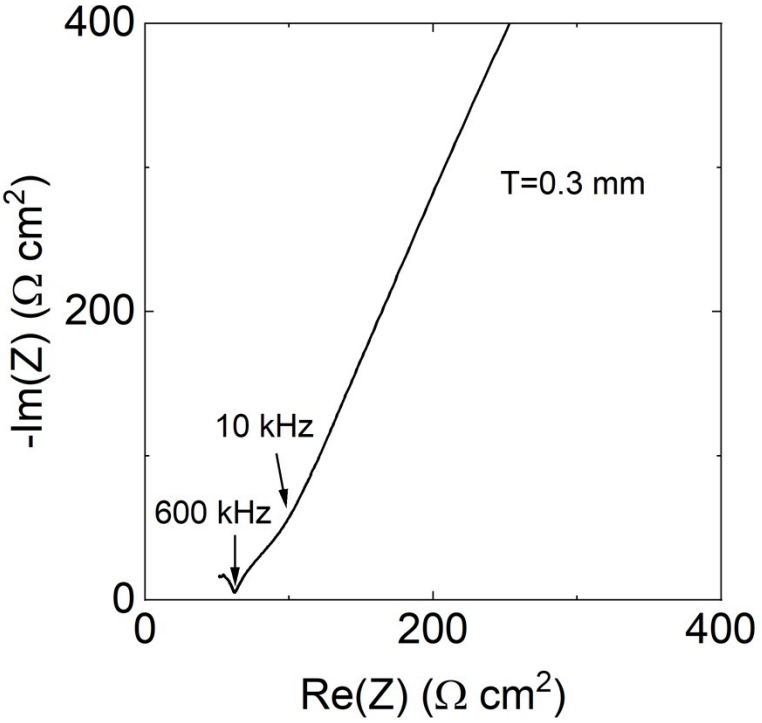

Figure S1. A typical EIS spectrum for LLZO electrolyte at room temperature with Au electrodes.

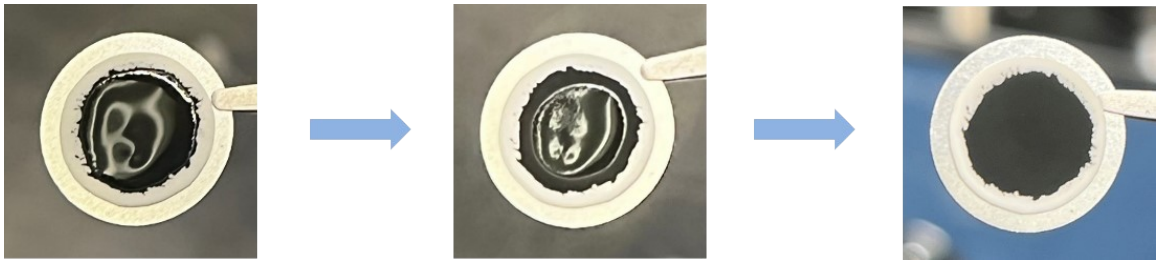

Figure S2. Cathode appearance evolution during 7 min drying process.

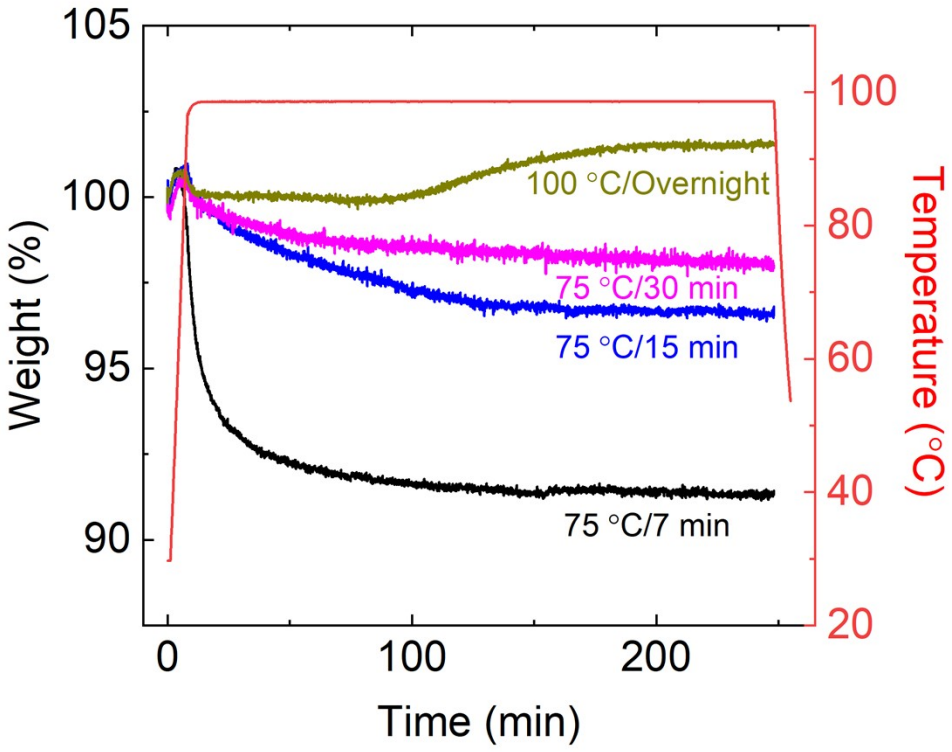

Figure S3. Analysis of residual NMP loading by thermogravimetric analysis (TGA) in argon atmosphere.

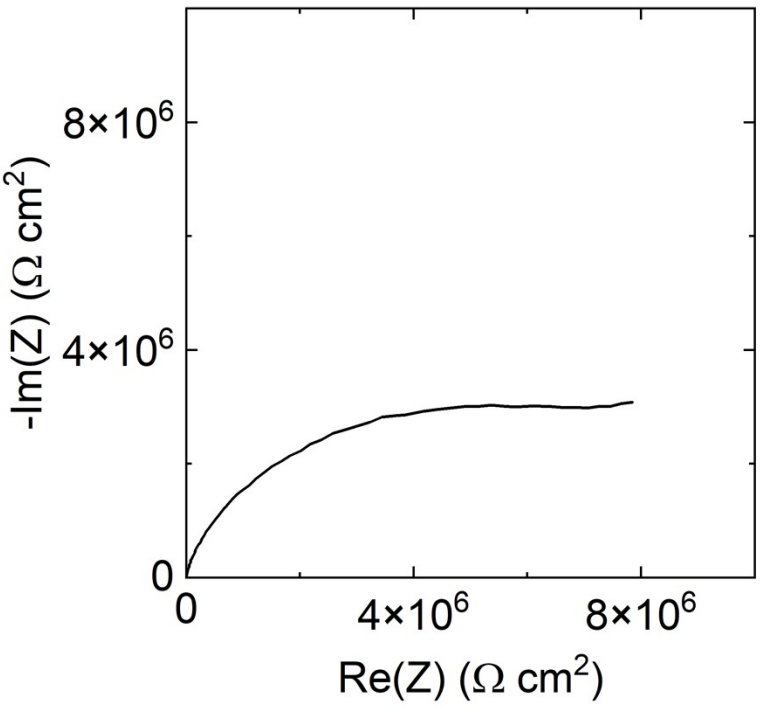

Figure S4. EIS of a full cell with cathode drying at 100 °C overnight under vacuum.

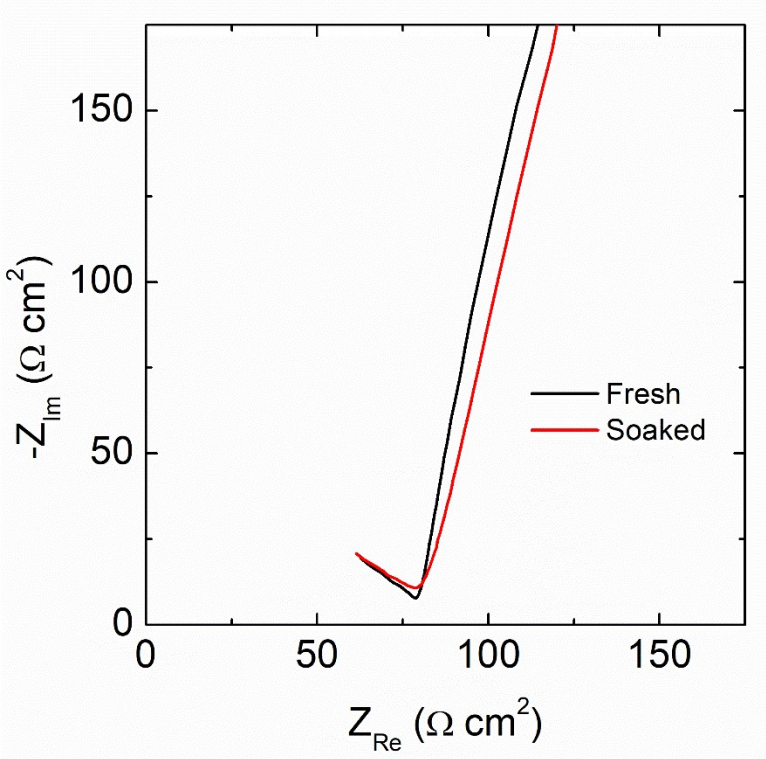

Figure S5. EIS of a LLZO pellet before and after soaking in PVDF/LiTFSI/NMP solution for 20 h, showing no degradation.

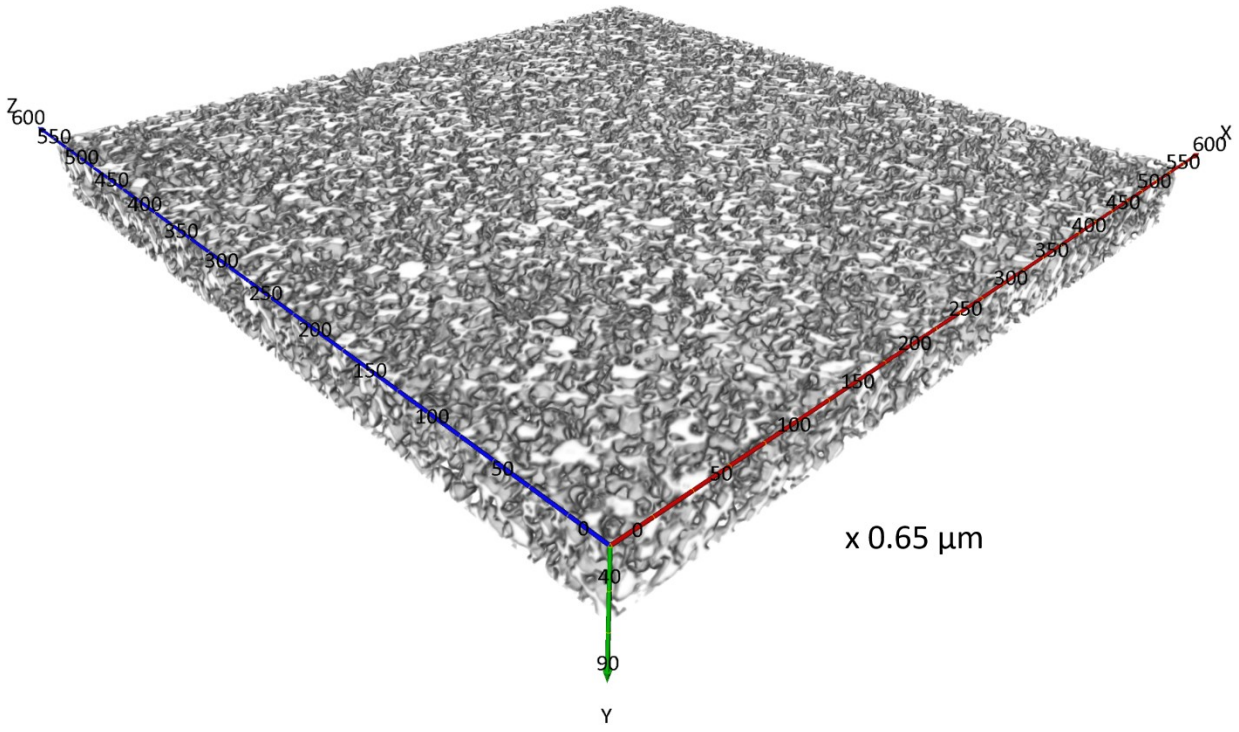

Figure S6. Synchrotron X-ray tomography 3D reconstruction image of the cathode with 8.5% LiTFSI.

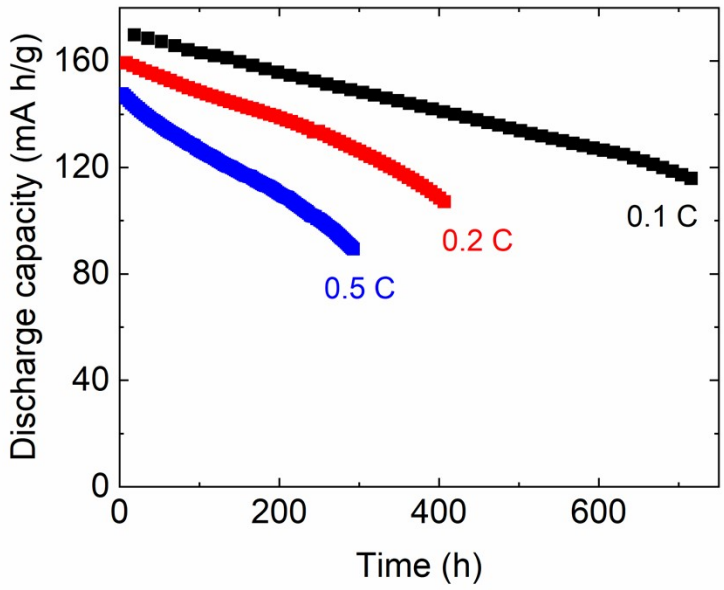

Figure S7. Discharge capacity cycled at 0.1 C, 0.2 C and 0.5 C with cycling time.

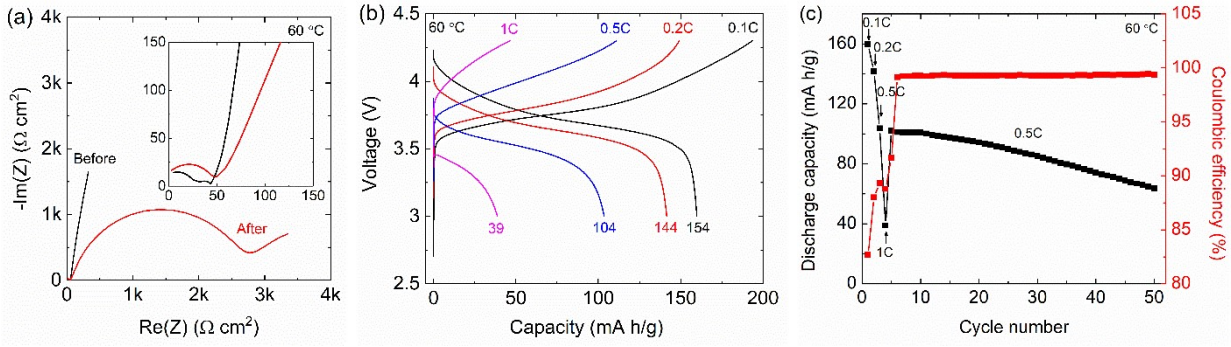

Figure S8. Full cell performance at 60 °C. (a) EIS before and after cycling; (b) Charge/discharge curves at 0.05 C, 0.1 C, 0.2 C, and 0.5 C; (c) Discharge capacity and coulombic efficiency versus cycle number.

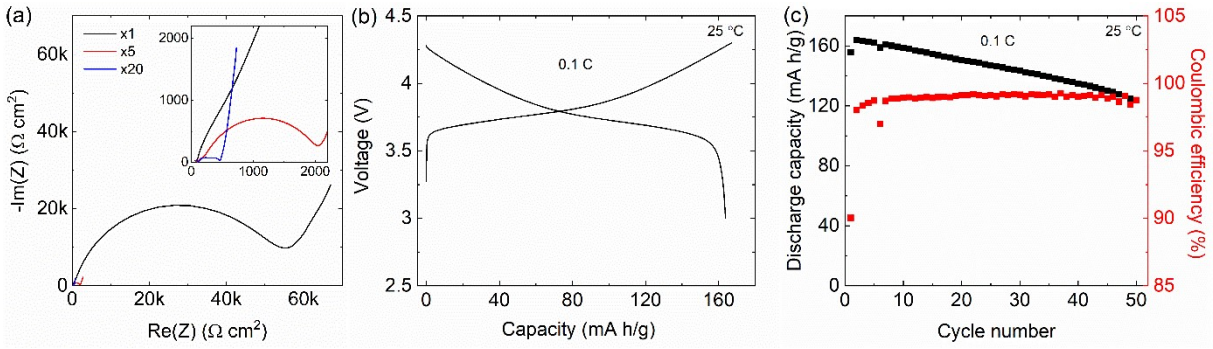

Figure S9. Hybrid full cell performance at 25 °C with cathodes completely dried of NMP, followed by addition of liquid electrolyte (1 M $LiPF_6$ in EC/DMC/DEC). (a) EIS before cycling with various amount of liquid electrolyte (1, 5, and 20 times of NMP residue by weight); (b) Charge/discharge curves at 0.1 C; (c) Discharge capacity and coulombic efficiency versus cycle number of the cell with liquid electrolyte (20 times of NMP residue).

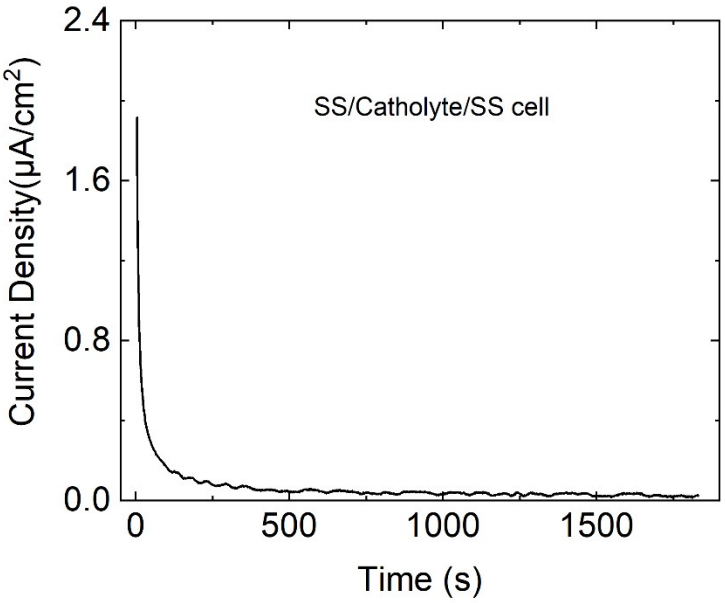

Figure S10. Current density-time curve of the SS/catholyte/SS cell under DC polarization at 0.5 V.