Supporting Information

Superior compatibilities of the oxide LISICON-type solid electrolyte enable high energy density all-solid-state batteries

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Supplementary Information

Table S1. Lattice parameters of NMC and LSPO after co-sintering at different temperatures. Single standard deviations are given in parenthesis.

[Unit: Å]	*a*	*b*	*c*
NMC622	2.869(2)	2.869(2)	14.22(2)
500	2.868(1)	2.868(1)	14.21(2)
700	2.881(1)	2.881(1)	14.22(1)
900	2.869(1)	2.869(1)	14.21(2)
[Unit: Å]	*a*	*b*	*c*
LSPO	10.59(1)	6.120(7)	5.005(5)
500	10.57(3)	6.11(2)	5.00(1)
700	10.58(1)	6.118(9)	5.005(5)
900	10.59(2)	6.11(1)	5.011(7)

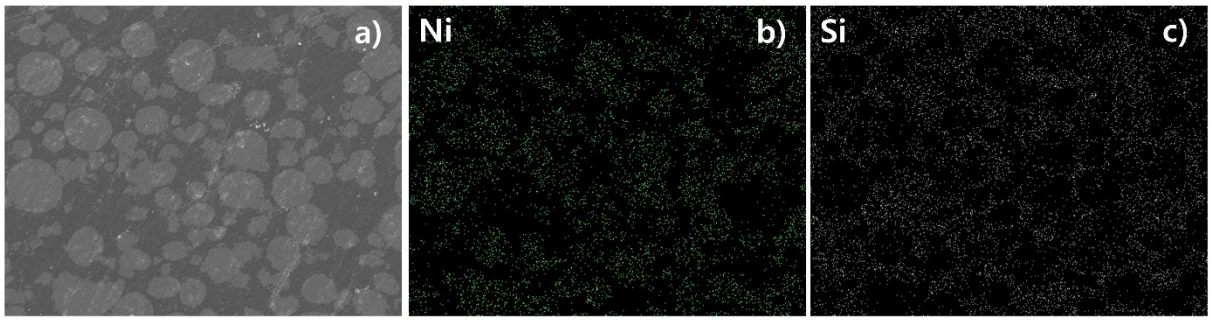

Figure S1. a) SEM and EDS image of b) Ni, c) Si of the co-sintered NMC622 with LSPO SE at 700 °C

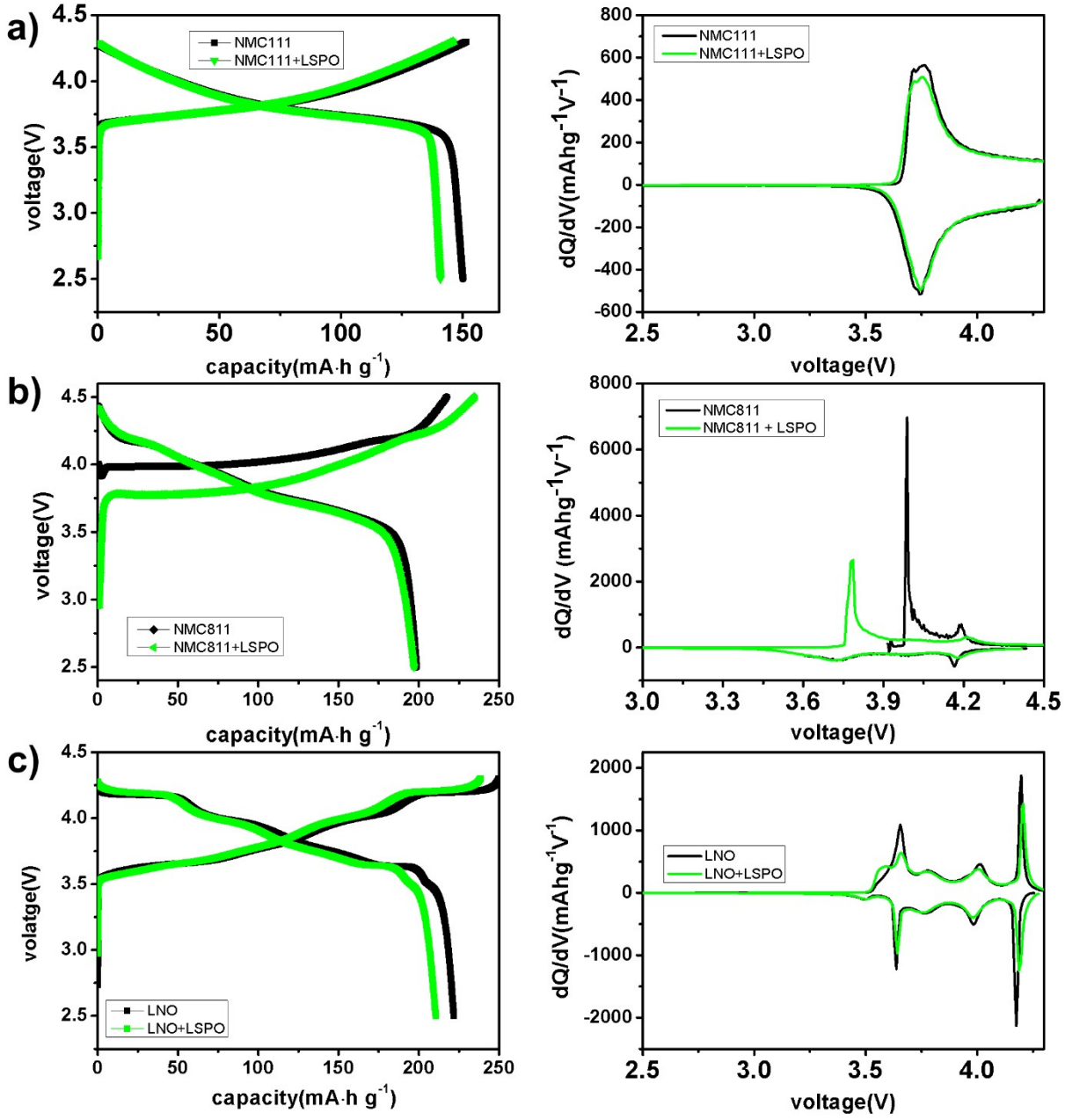

Figure S2. Voltage profiles and differential capacity (dQ/dV) plots of (a) $LiNi_{1/3}Mn_{1/3}Co_{1/3}O_2$ (NMC111), (b) $LiNi_{0.8}Mn_{0.1}Co_{0.1}O_2$ (NMC811) before and after co-sintering with LSPO SE at 700 °C

Table S2. Lattice parameters of LSPO SE before and after wetting Li metal at 210 °C

[Unit: Å]	*a*	*b*	*c*
Before	10.58(1)	6.120(9)	5.001(6)
after	10.58(1)	6.116(6)	5.001(4)

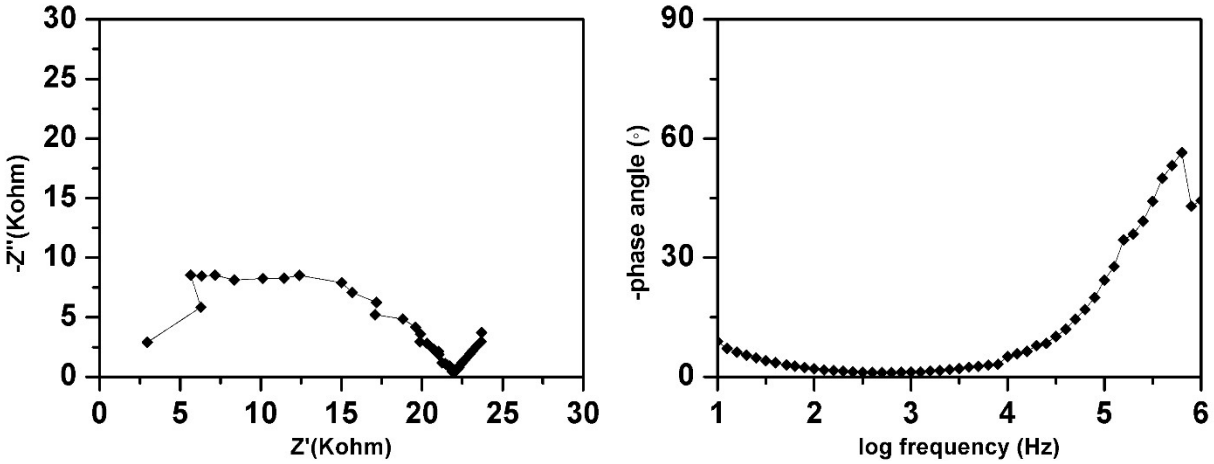

Figure S3. Nyquist and bode plot of the LSPO-based ASSB cell. (NMC622-LSPO SE cathode composite/LSPO SE/Li metal).

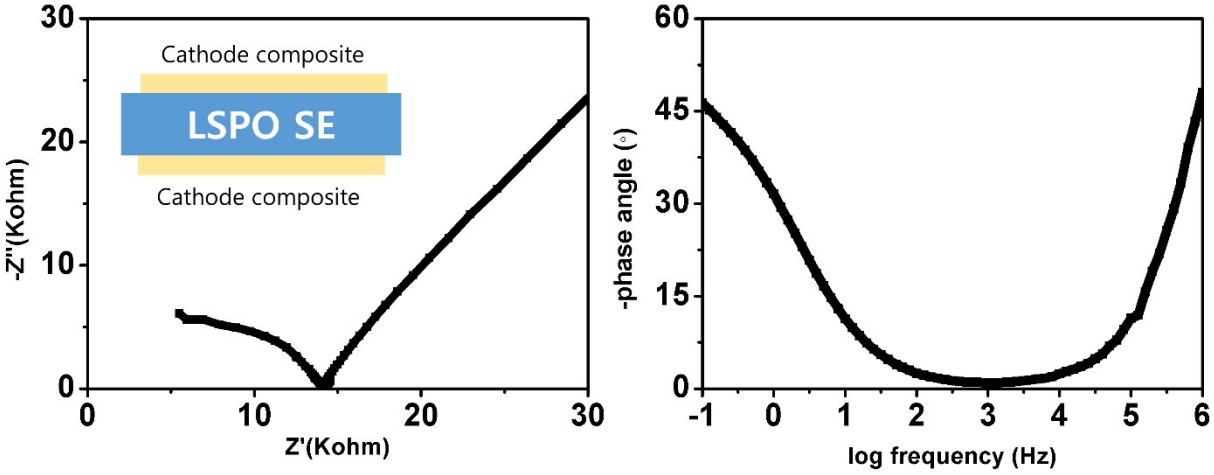

Figure S4. Nyquist and bode plot of the NMC622 cathode composite/ LSPO/NMC622 cathode composite symmetric cell

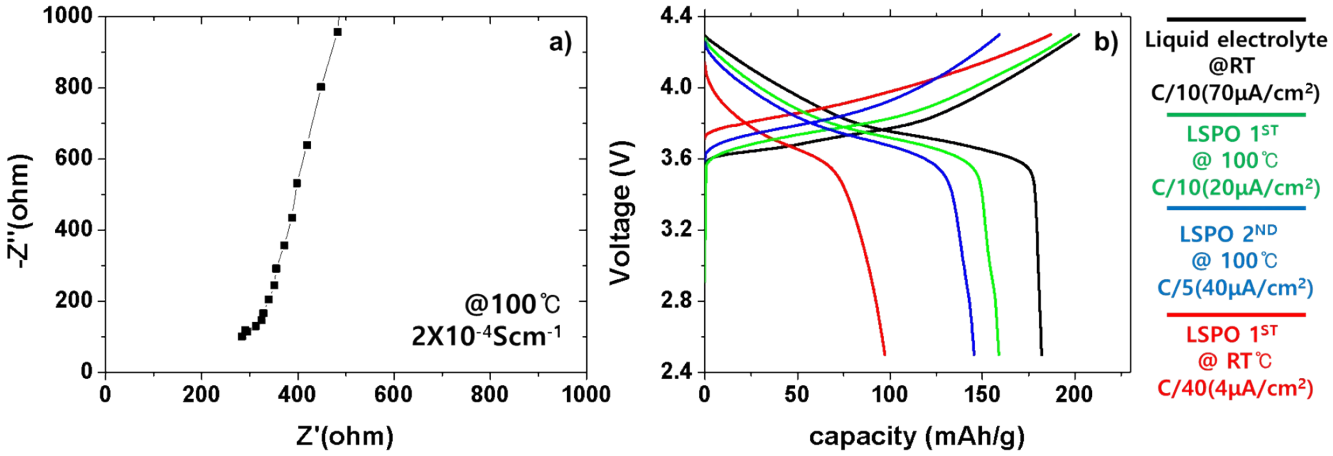

Figure S5. (a) Nyquist plot data of LSPO SE at 100℃ (b) Voltage curves of the Co-sintered ASSB with NMC622 and Li at different rates and temperature. Liquid electrolyte at RT: C/10 (70 μA/cm^2), ASSB 1st at 100 °C: C/10 (20 μA/cm^2), ASSB 2nd at 100 °C: C/5 rate (40 μA/cm^2), ASSB at RT: C/40 (4μA/cm^2)