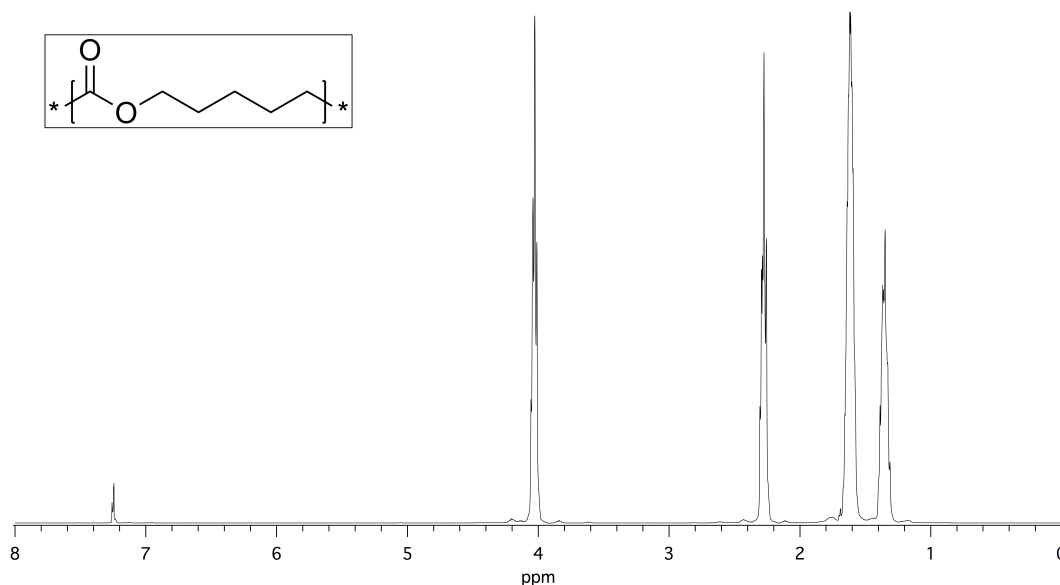


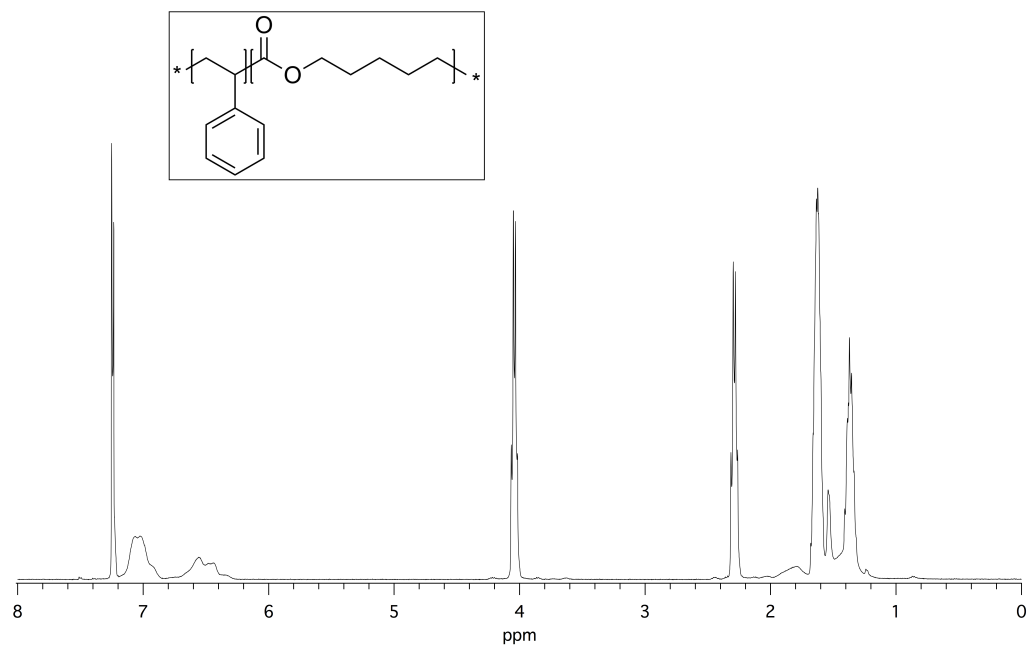
ϵ -Caprolactone-based Solid Polymer Electrolytes for Lithium-Ion Batteries: Synthesis, Electrochemical Characterization and Mechanical Stabilization by Block Copolymerization

*Andreas Bergfelt**, *Matthew J. Lacey*, *Jonas Hedman*, *Christofer Sångeland*, *Daniel Brandell*,
and Tim Bowden

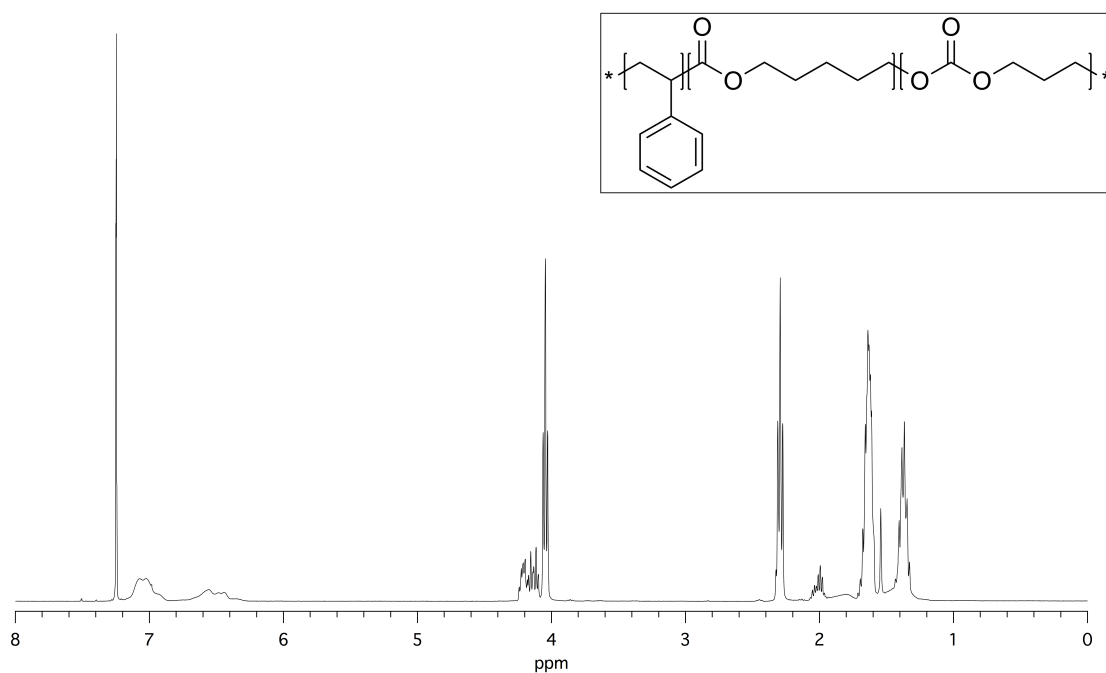
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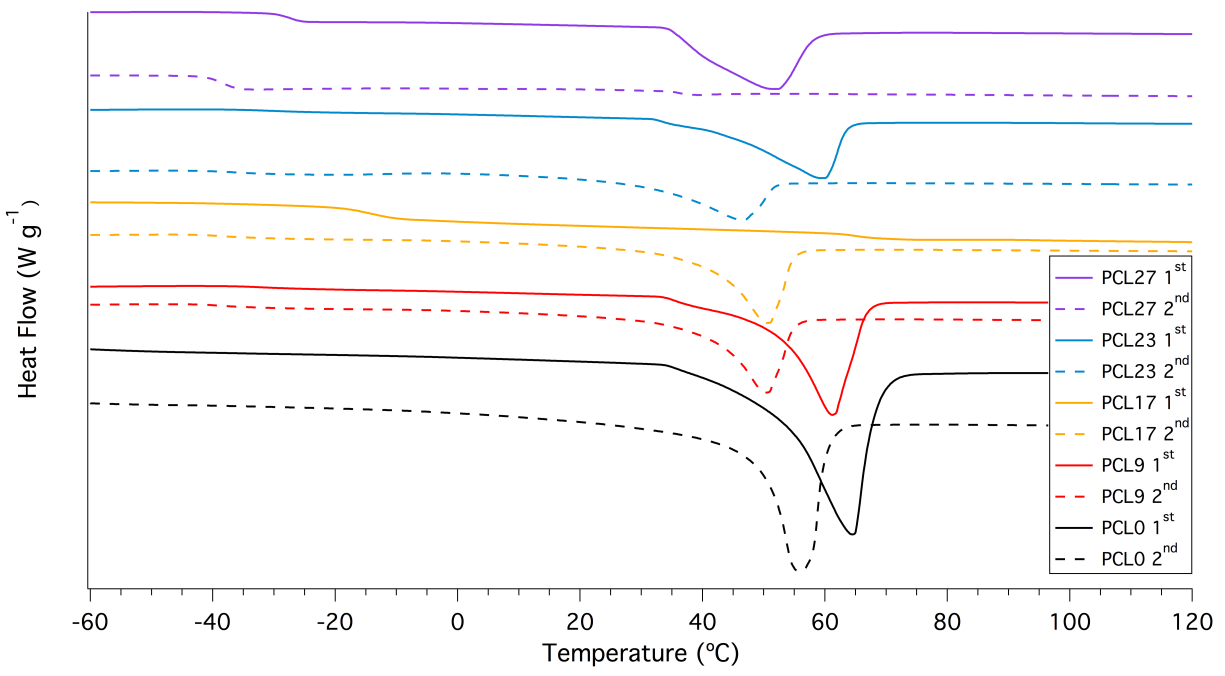
SI-1. ¹H-NMR spectra of PCL recorded in CDCl₃ that appears at 7.3 ppm.



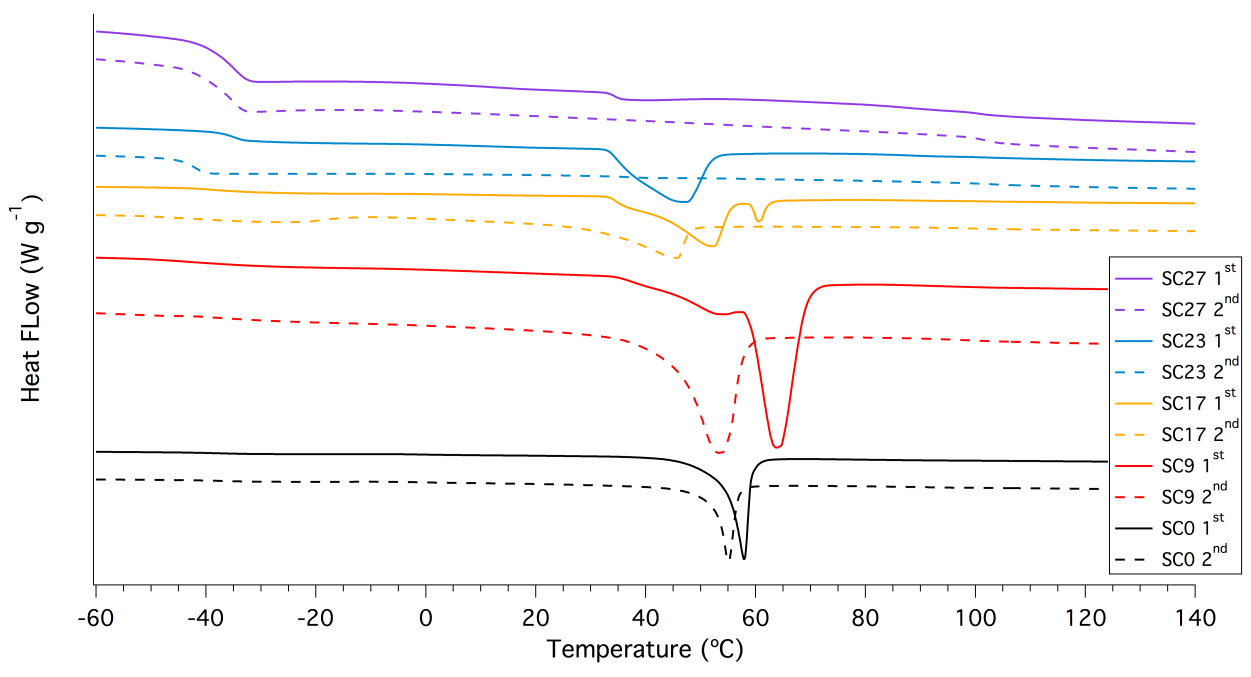
SI-2. $^1\text{H-NMR}$ spectra of the SC diblock copolymer. The solvent CDCl_3 appears at 7.3 ppm.



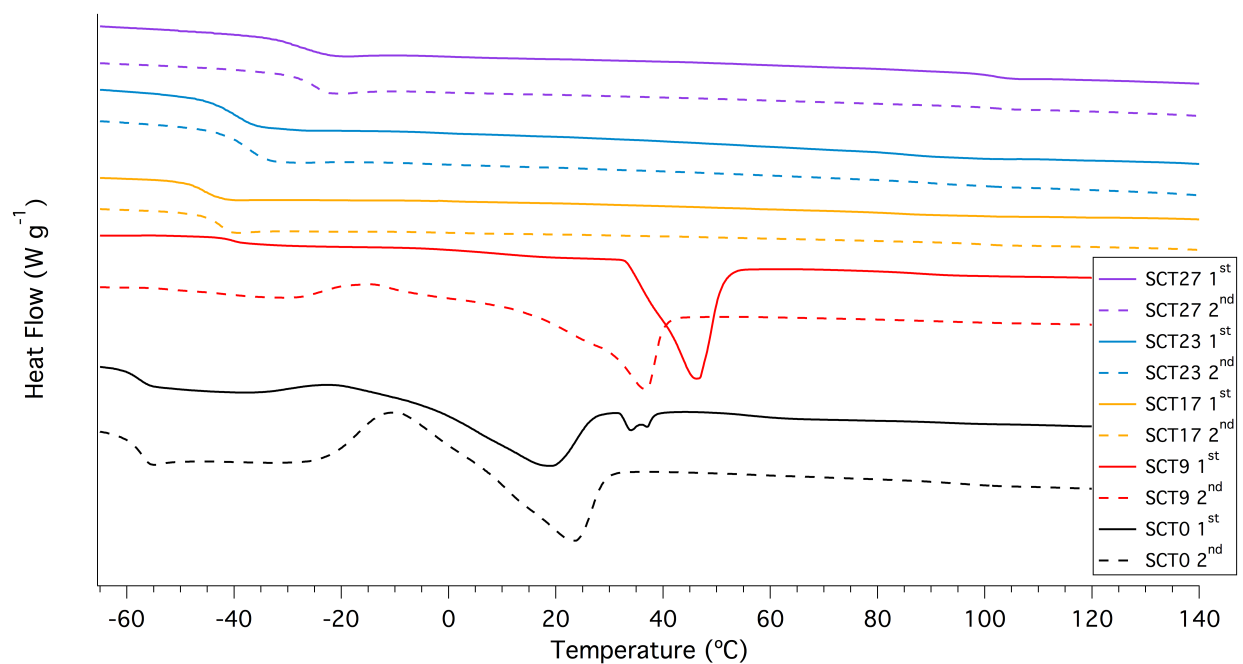
SI-3. $^1\text{H-NMR}$ spectra of the SCT diblock copolymer showing the characteristic PS region at about 7 ppm, PCL at 4 ppm, and PTMC at about 4.1 ppm. CDCl_3 appears at 7.3 ppm.



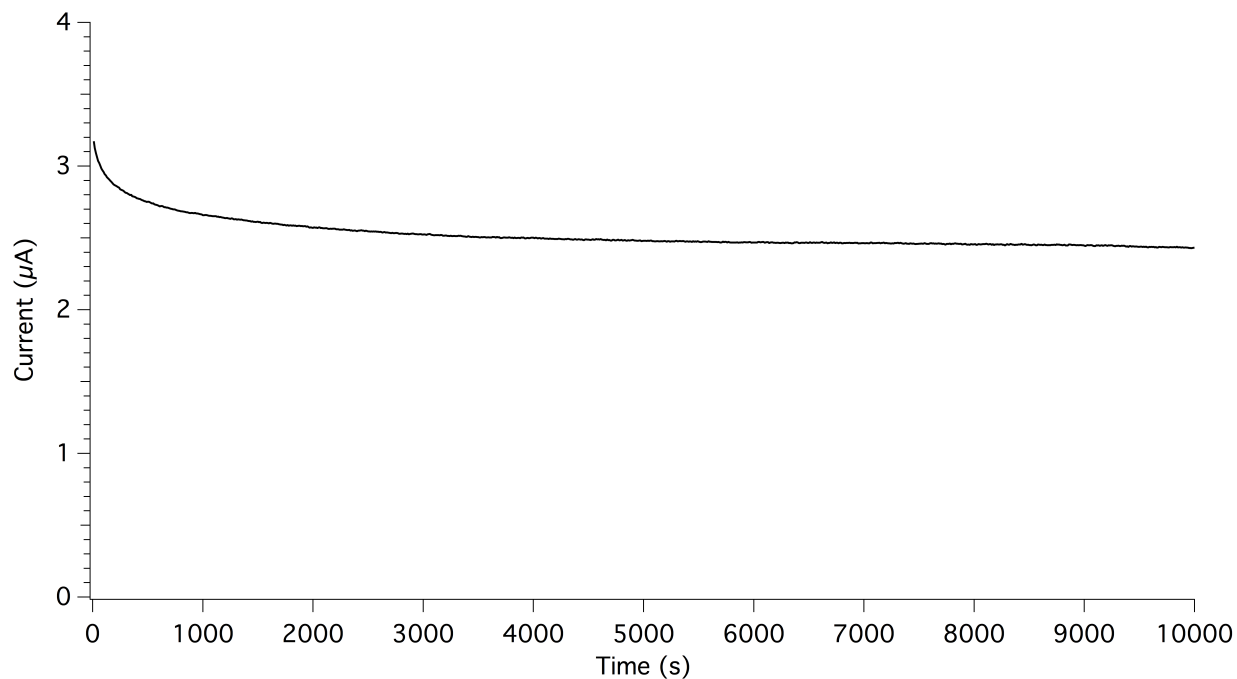
SI-4. DSC curves for PCL. The solid lines represent the first heating scan, and the dashed lines represent the second heating scan. The curves are shifted vertically for the sake of clarity.



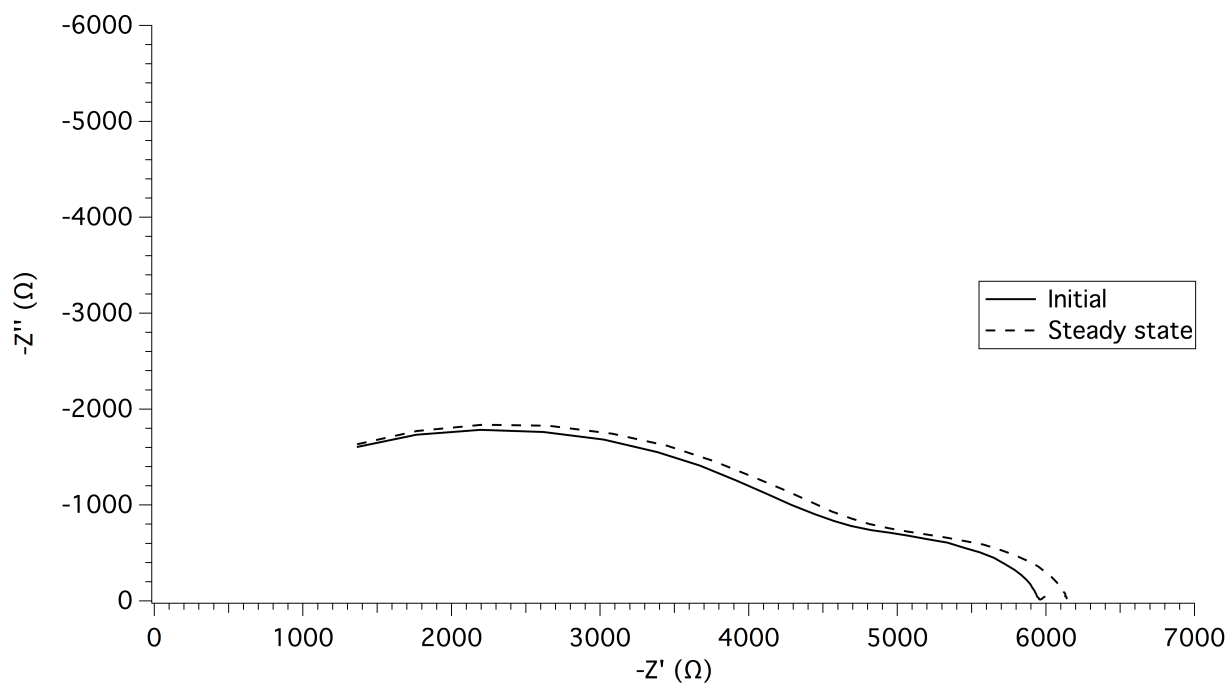
SI-5. DSC curves for SC. The solid lines represent the first heating scan, and the dashed lines represent the second heating scan. The curves are shifted vertically for the sake of clarity.



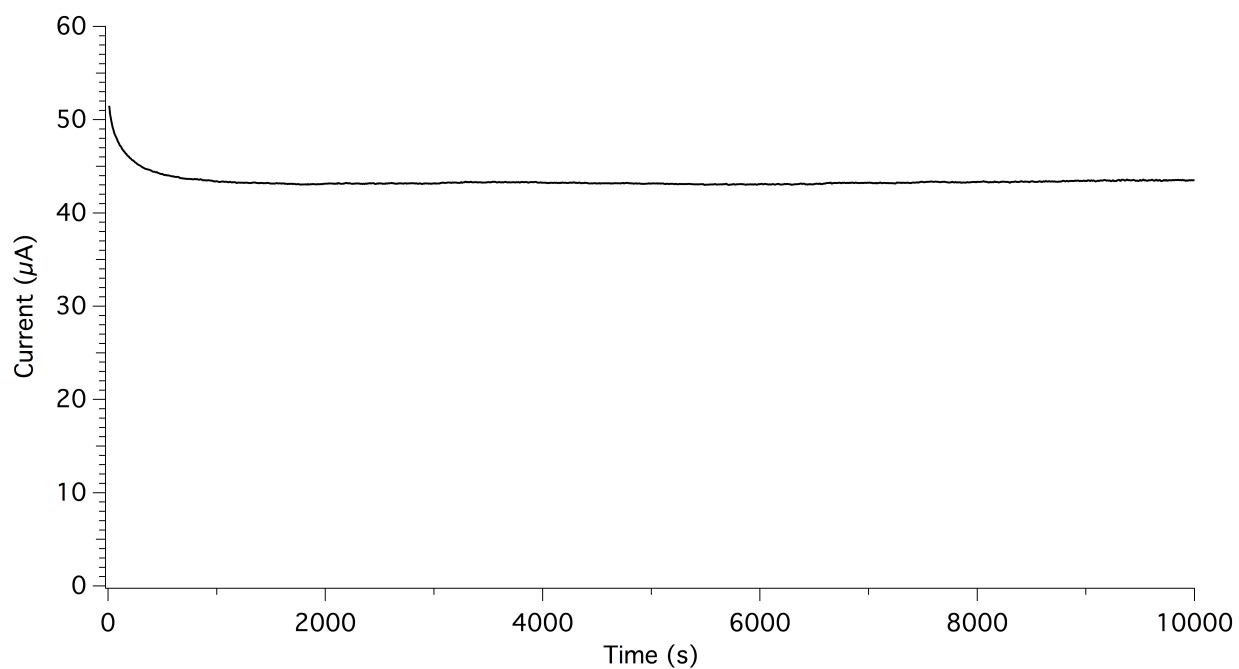
SI-6. DSC curves for SCT. The solid lines represent the first heating scan, and the dashed lines represent the second heating scan. The curves are shifted vertically for the sake of clarity.



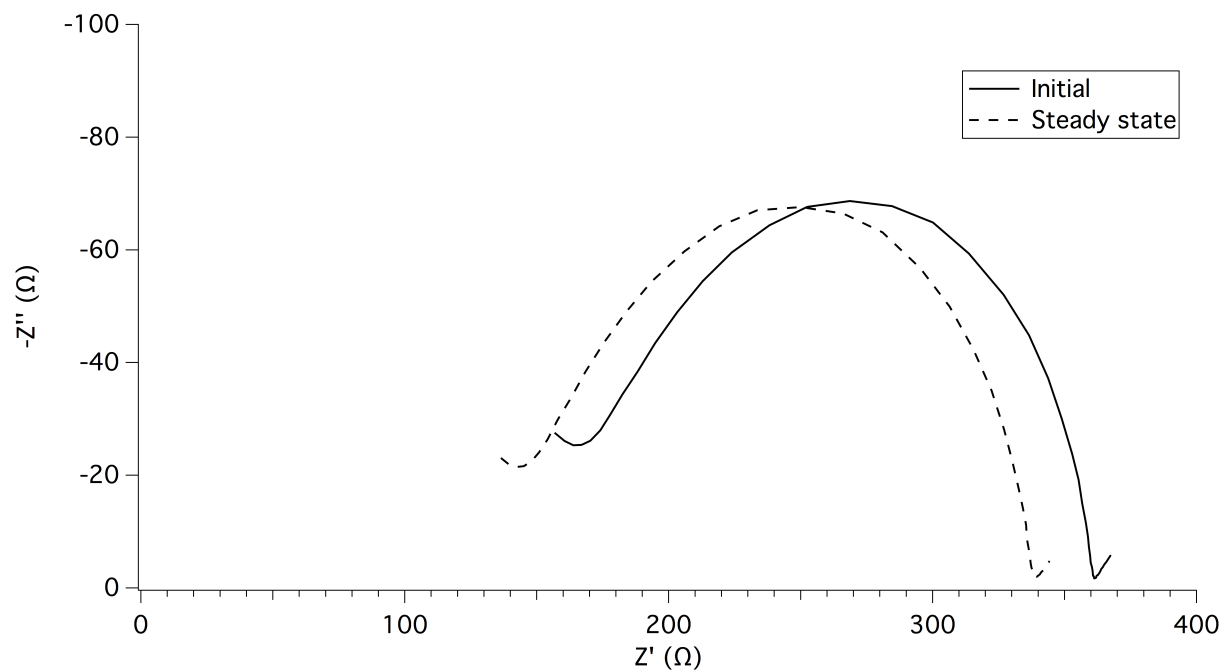
SI-7. Chronoamperogram of SC23, measured in a symmetrical Li | SC23 | Li cell at 60 °C, with a voltage step of 20 mV.



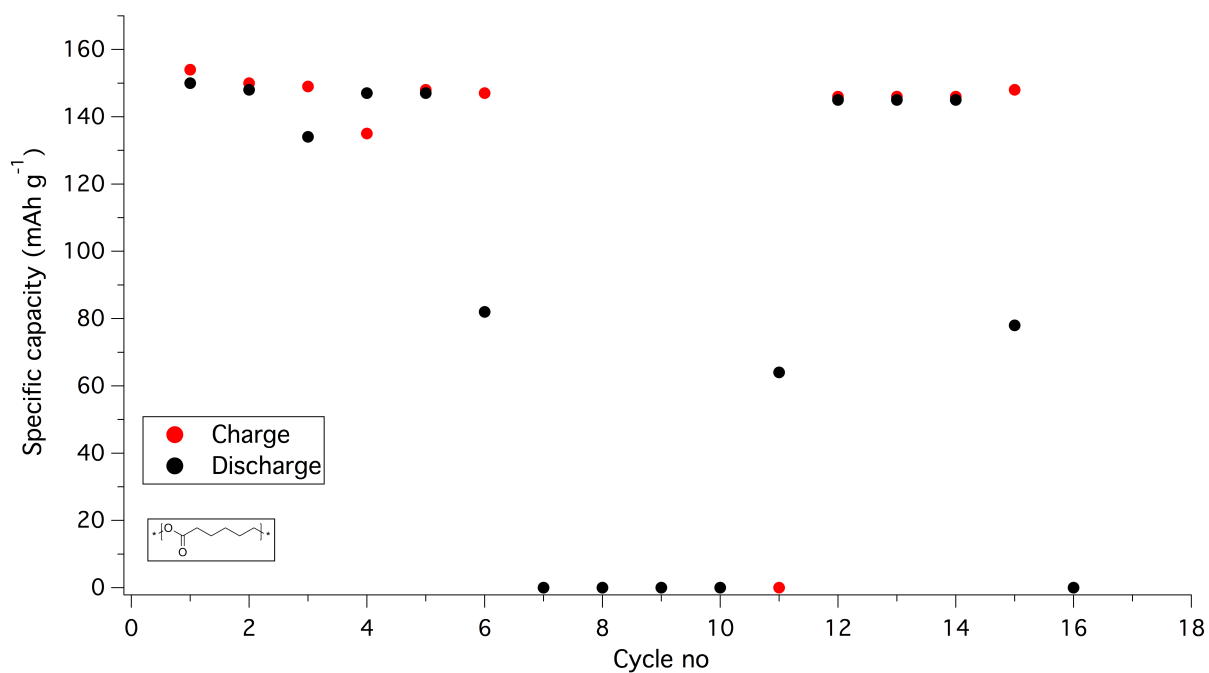
SI-8. Initial impedance before voltage step, and steady state impedance data for a symmetrical Li | SC23 | Li cell at 60°C.



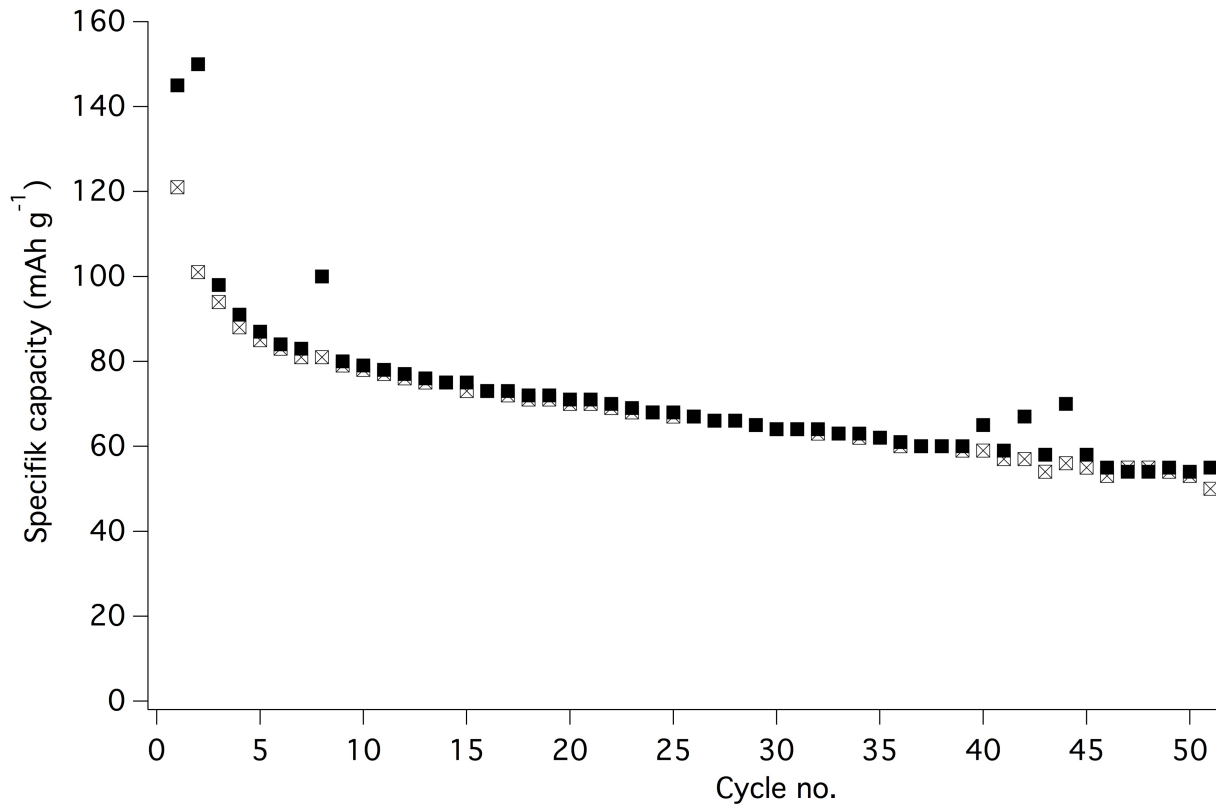
SI-9. Chronoamperogram of SCT17, measured in a symmetrical Li | SCT17 | Li cell at 40°C, with a voltage step of 20 mV.



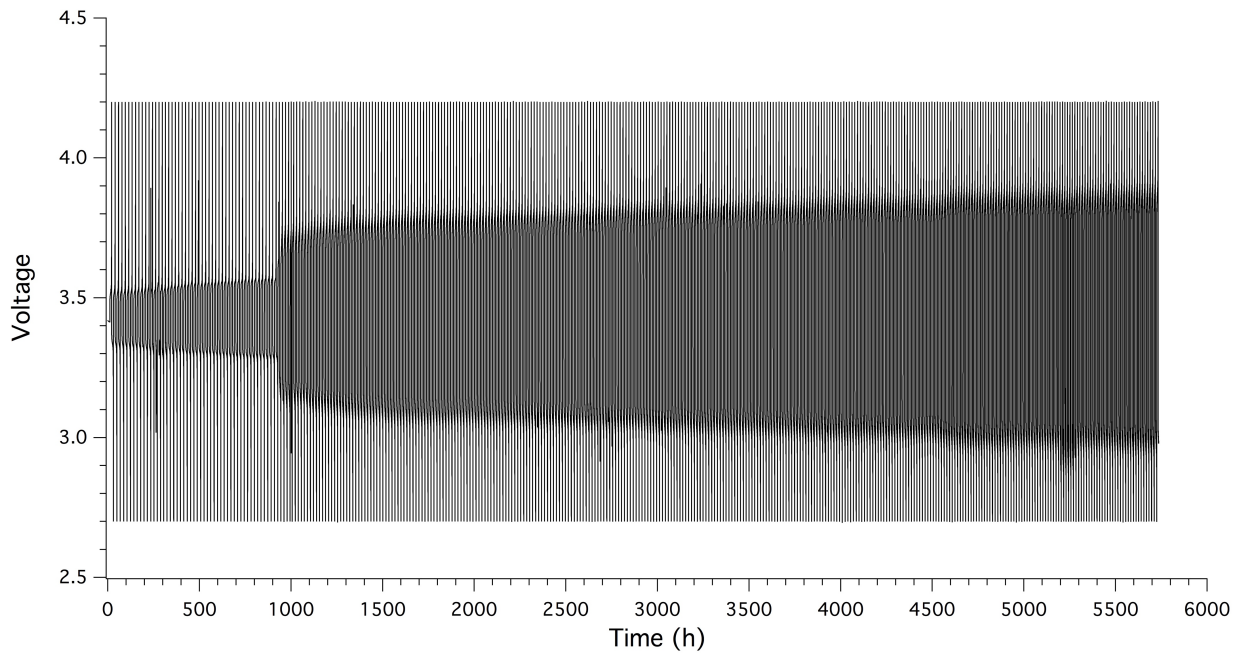
SI-10. Initial impedance before voltage step, and steady state impedance data for a symmetrical Li | SCT17 | Li cell at 40°C.



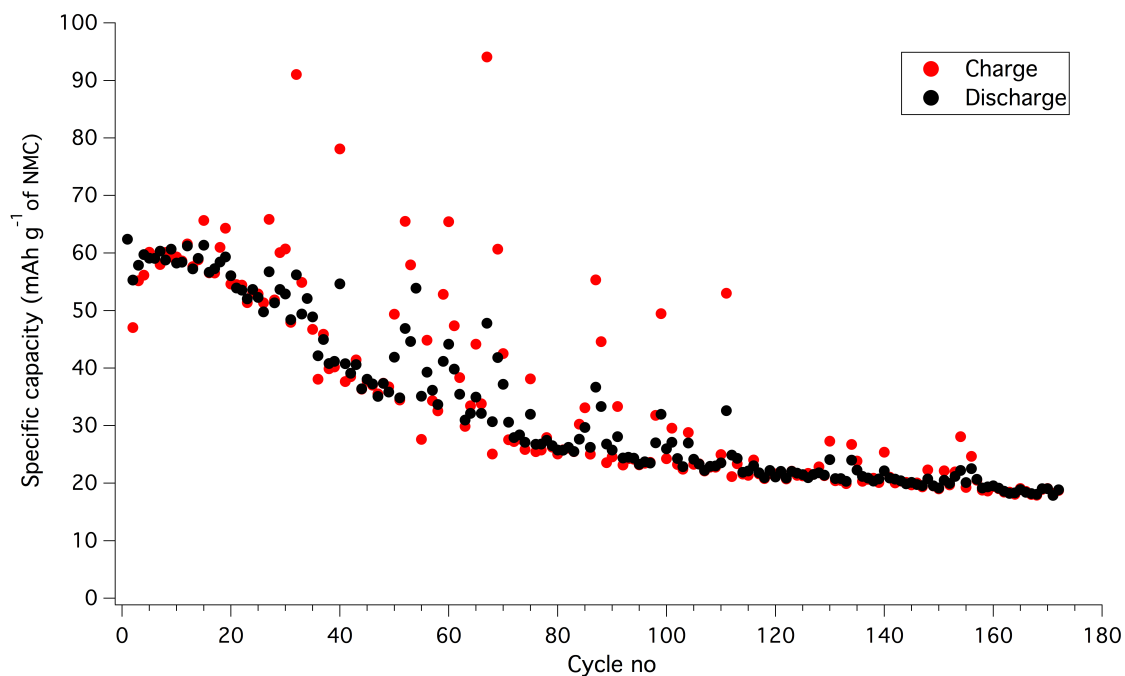
SI-11. Cycling of a Li | PCL23 | LiFePO₄ half-cell operating at 60°C. No PCL-based device operated for more than about 15 cycles before failing.



SI-12. Graphite | PCL29 | LiFePO₄ coin-cell operating at 40°C and at C/20.



SI-13. Voltage profile for Li | SCT | LiFePO₄ half-cell operating at 40°C and at C/10.



SI-14. Cycling of a coin cell device cycling 40°C and at C/10 with the configuration graphite | SCT17 | NMC. SCT17 was solvent cast onto the electrodes before they were sandwiched together and annealed at 40°C for 6 h before cycling.