

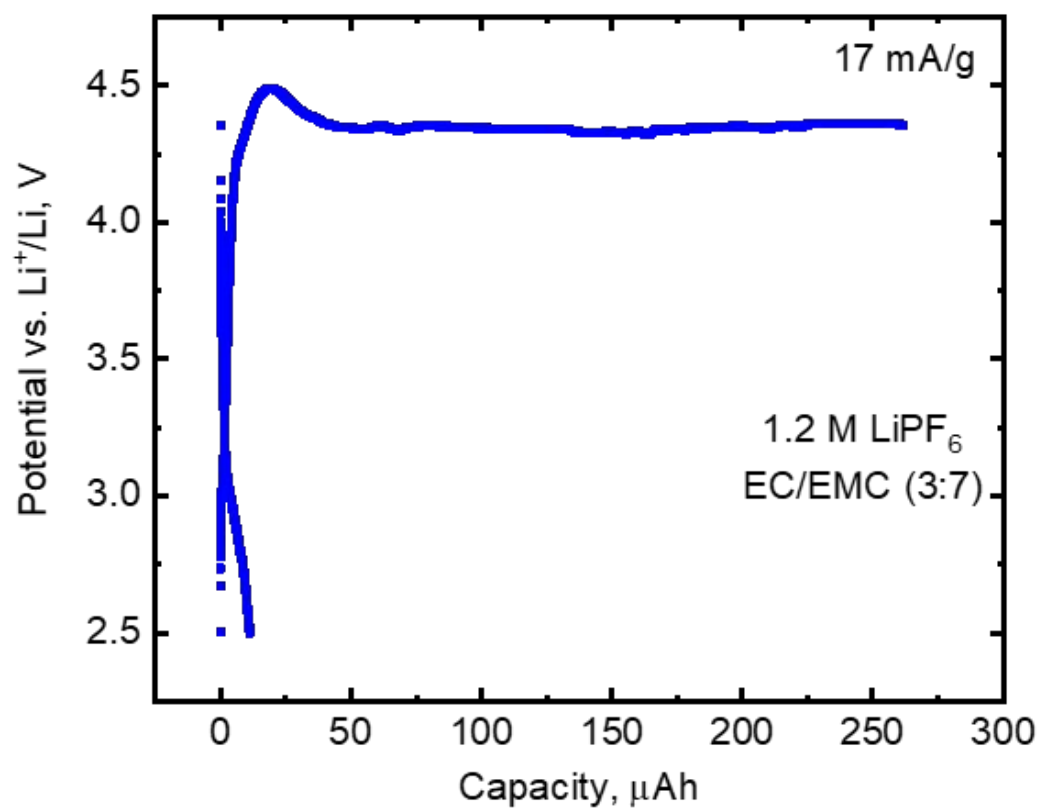
# Supplemental Section: Structural Degradation of High Voltage NMC Cathodes in Solid-State Batteries and Implications for Next Generation Energy Storage

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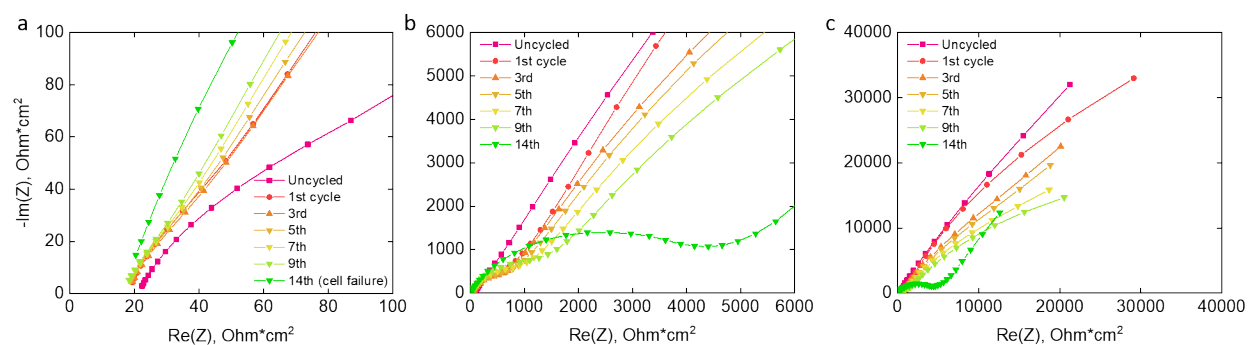
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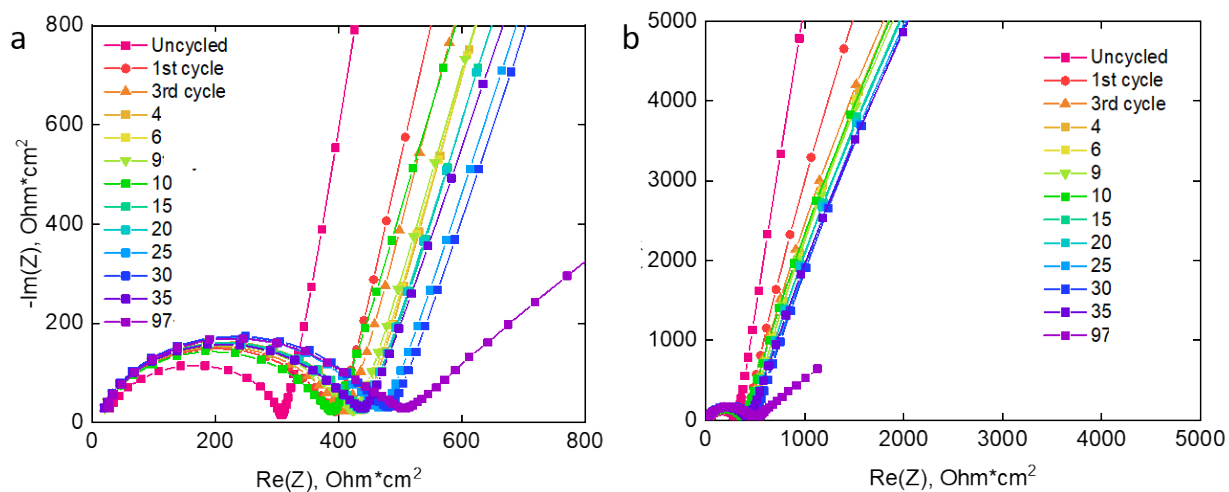
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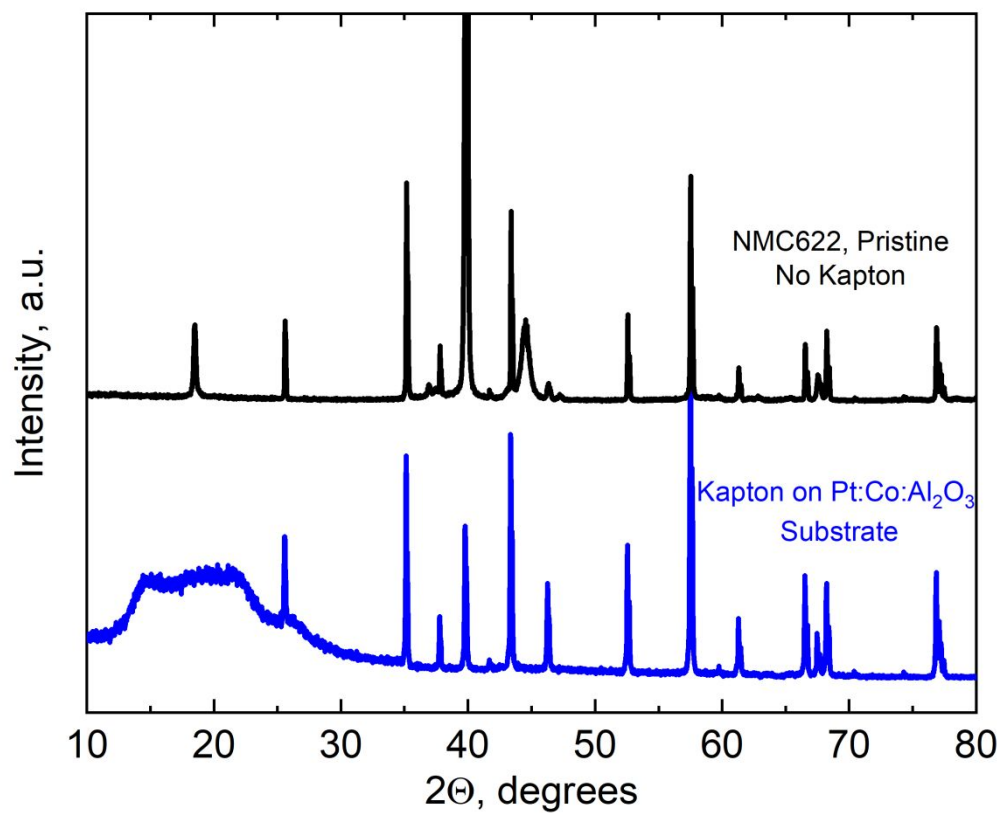
**Figure S1.** Charge and discharge profile of liquid cell cycle 23 at  $\pm 17$  mA/g



**Figure S2.** AC impedance data of liquid electrolyte cell for a) high frequency, b) medium frequency, and c) low frequency from uncycled through cell failure during cycle 14



**Figure S3.** AC impedance data of solid state battery for a) high frequency and b) medium frequency and low frequency region from uncycled through cycle 97 when cell was removed for XRD



**Figure S4.** XRD of pristine 1.5  $\mu\text{m}$  solid state NMC622 electrode without Kapton covering and Pt:Co:Al<sub>2</sub>O<sub>3</sub> substrate with Kapton covering.