

Supporting Information

Probing the Origin of Voltage Decay in Li-Rich Layered Cathode Materials at Atomic Scale

Yan Wu,^{,†,‡} Cheng Ma,^{§,‡} Jihui Yang,[†] Zicheng Li,[⊥] Lawrence F. Allard,[§] Chengdu Liang[§] and Miaofang Chi^{*,§}*

[†]General Motors Global R&D Center, 30500 Mound Rd. Warren, Michigan 48090, United States

[§]Center for Nanophase Materials Sciences, Oak Ridge National Laboratory, Oak Ridge, Tennessee 37831, United States

[†]Department of Materials Science & Engineering, University of Washington, Seattle, Washington 98195, United States

[⊥]Optimal, Inc., Plymouth, Michigan 48170, United States

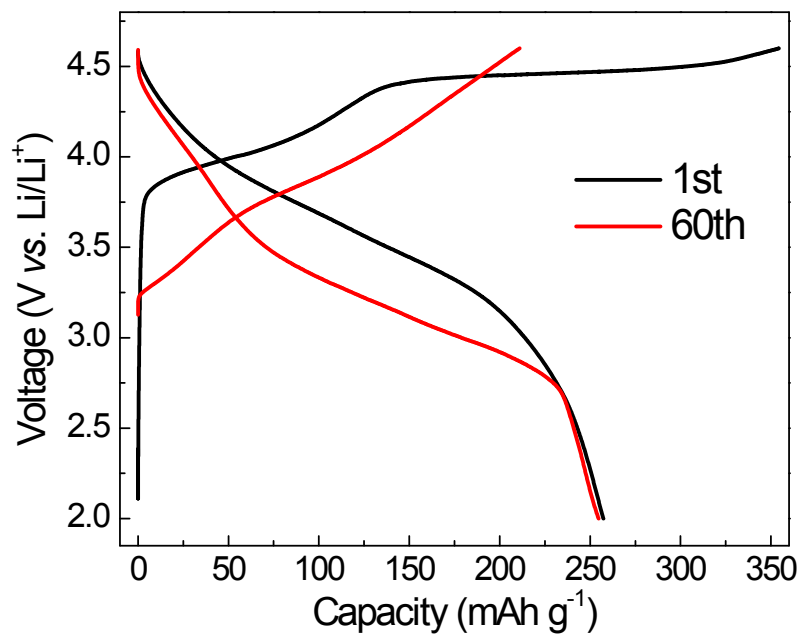


Figure S1. Voltage profiles of the 1st and 60th cycles between 2 and 4.8 V at C/100. The charge and discharge from the 2nd to 59th cycle were performed at C/10.

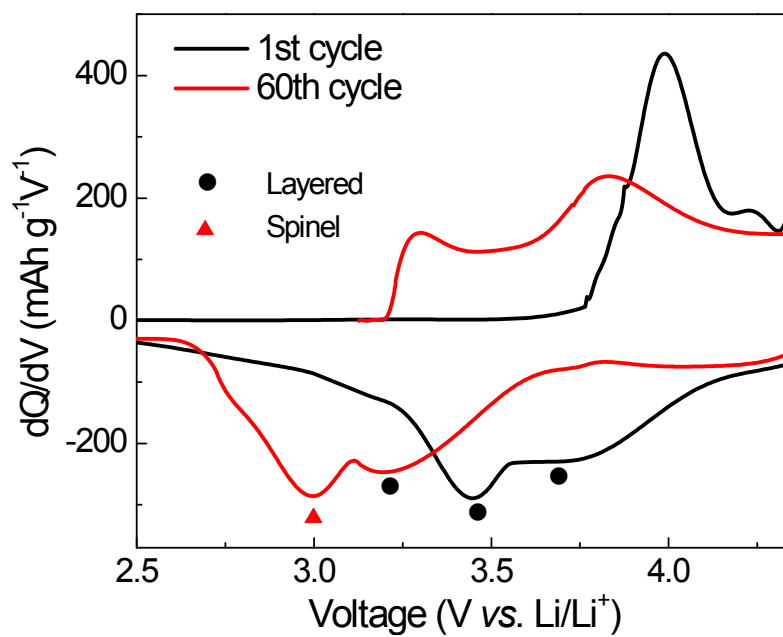


Figure S2. dQ/dV plots of the 1st and 60th cycle between 2 and 4.8 V at C/100. The charge and discharge from the 2nd to 59th cycle were performed at C/10.

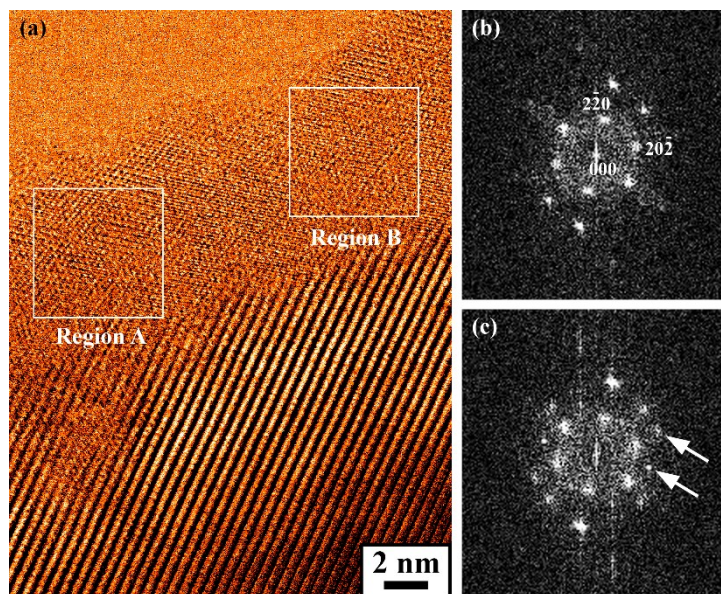


Figure S3. (a) BF-STEM image of a particle after 18 cycles between 2 and 4.8 V. (b) FFT pattern from region A. (c) FFT pattern from region B.

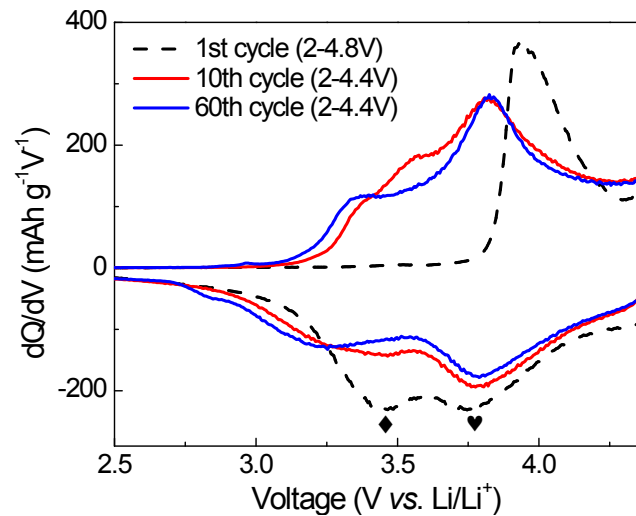


Figure S4. dQ/dV plots of the 2-4.4 V cycled specimen after charging to 4.8 V in the initial cycle. The cycling was performed at C/10. The $\text{Co}^{4+/3+}/\text{Ni}^{4+/3+/2+}$ and $\text{Mn}^{4+/3+}$ reduction peaks of the layered phase are marked in the discharge curve with ♥ and ♦, respectively.