

An Unavoidable Challenge for Ni-rich Positive Electrode Materials for Lithium-Ion Batteries

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Figure S1

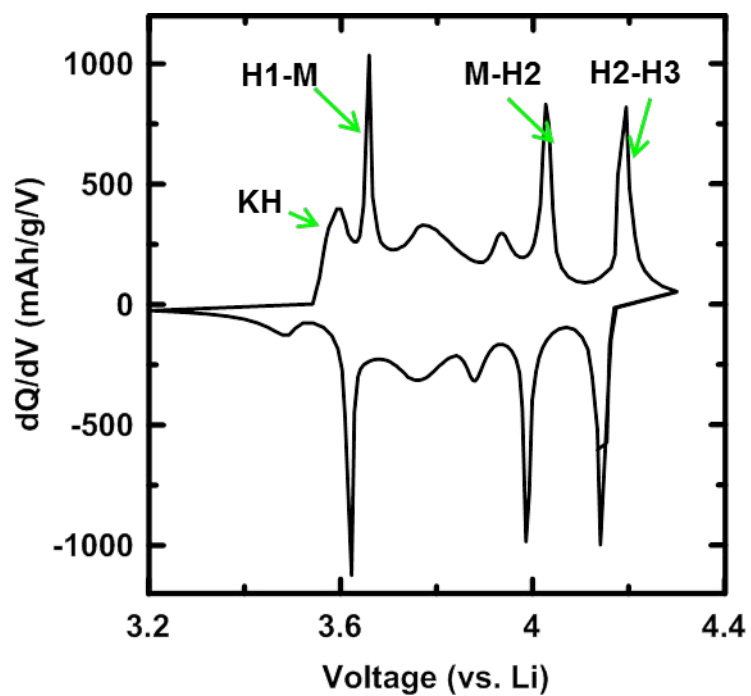


Figure S1. Differential capacity vs. voltage (dQ/dV vs. V) of LiNiO_2 with the kinetic hindrance (KH) region and phase transition peaks marked.

Figure S2

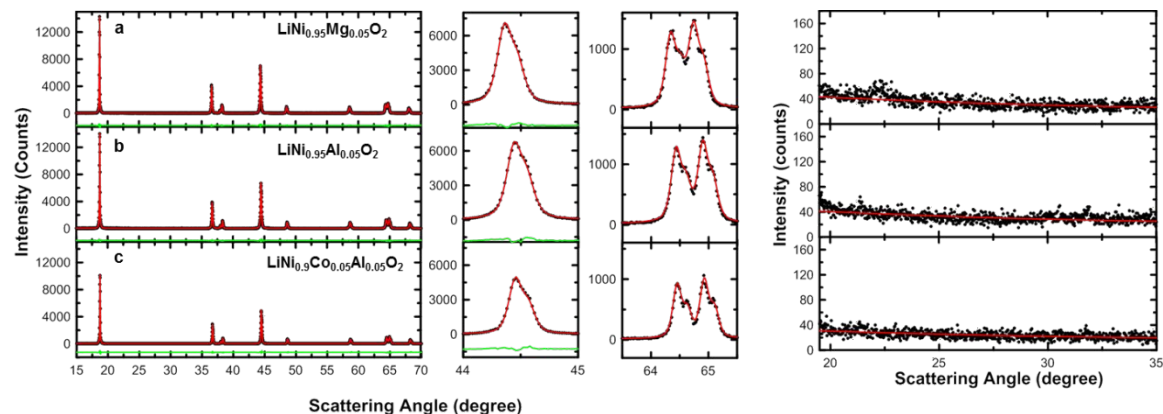


Figure S2. XRD patterns of (a) $\text{LiNi}_{0.95}\text{Mg}_{0.05}\text{O}_2$, (b) $\text{LiNi}_{0.95}\text{Al}_{0.05}\text{O}_2$, and (c) $\text{LiNi}_{0.9}\text{Co}_{0.05}\text{Al}_{0.05}\text{O}_2$. Expanded view of the (104) Bragg peak, (108)/(110) Bragg peaks, and impurity regions were shown. Black circles are experimental XRD data, solid red lines are calculated patterns from Rietveld refinement, and green lines show the differences between the measured and calculated patterns.

Figure S3

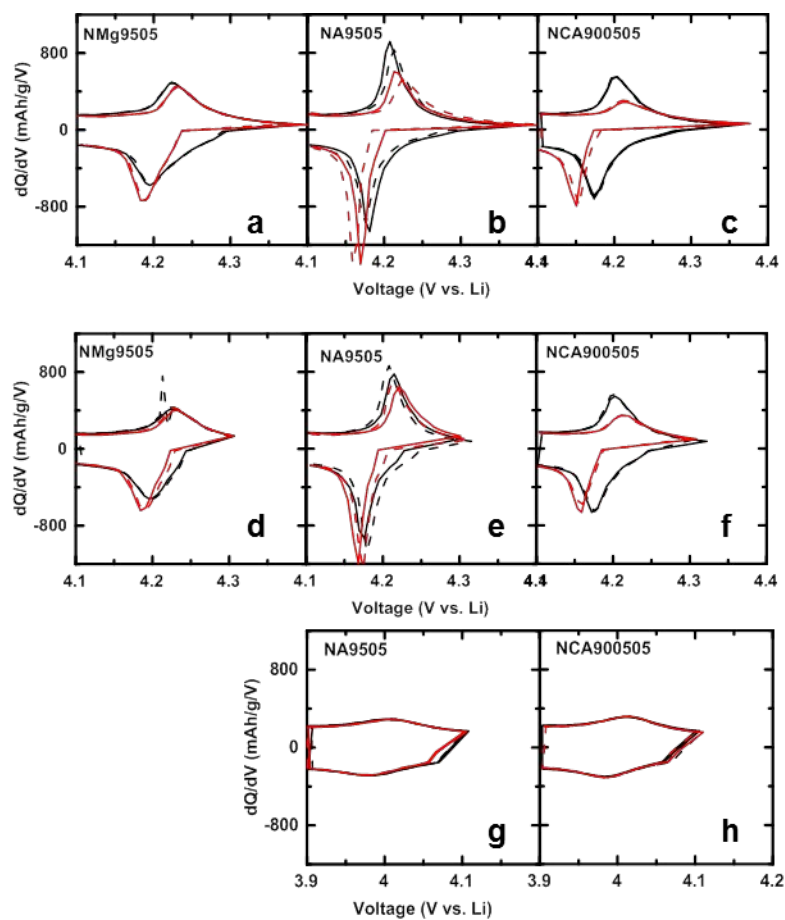


Figure S3. (a – h) The expanded views of dQ/dV vs. V of the 1st (black) and 50th (red) cycles for the data shown in Figure 5. Solid and dashed lines in the same color represent pair cells.

Figure S4.

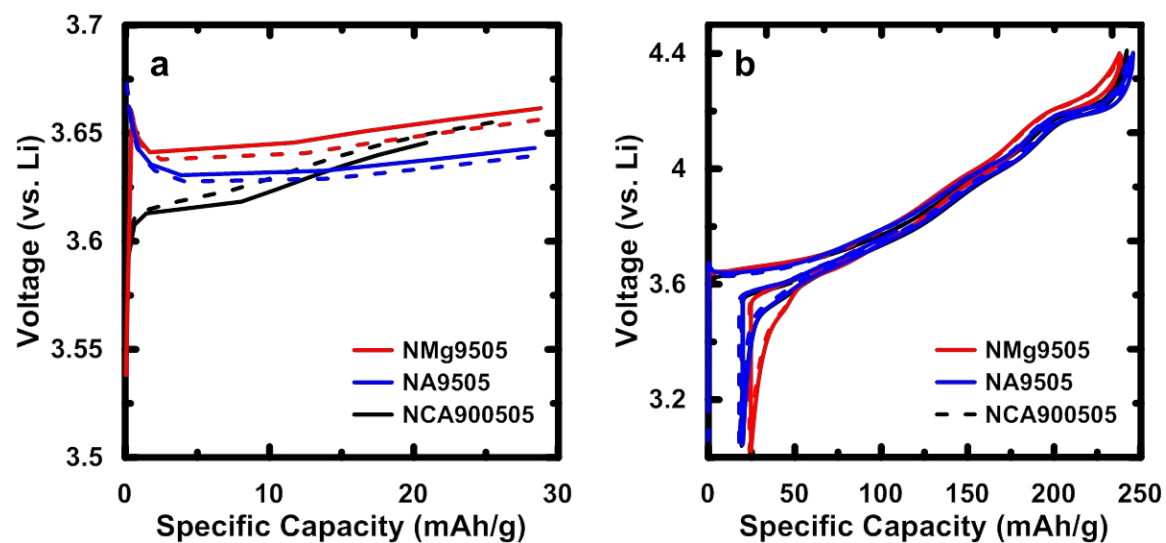


Figure S4. (a) Blow-up view of the 1st cycle voltage profiles for NMg9505, NA9505, and NCA900505 half cells. Solid and dashed curves represent pair cells. (b) **Full view of the voltage profile.**