

Supplementary Information

Extracting Maximum Capacity from Ni-rich

Li[Ni_{0.95}Co_{0.025}Mn_{0.025}]O₂ Cathode for High-Energy-Density

Lithium-Ion Batteries

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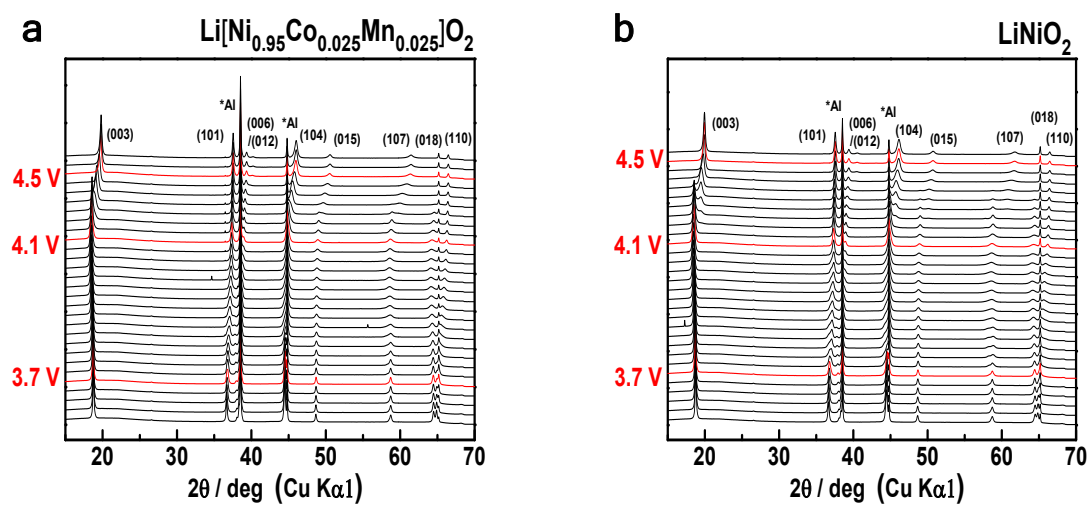


Fig S1. In-situ XRD patterns of (a) $\text{Li}[\text{Ni}_{0.95}\text{Co}_{0.025}\text{Mn}_{0.025}]\text{O}_2$ and (b) LiNiO_2 during the first charge process.

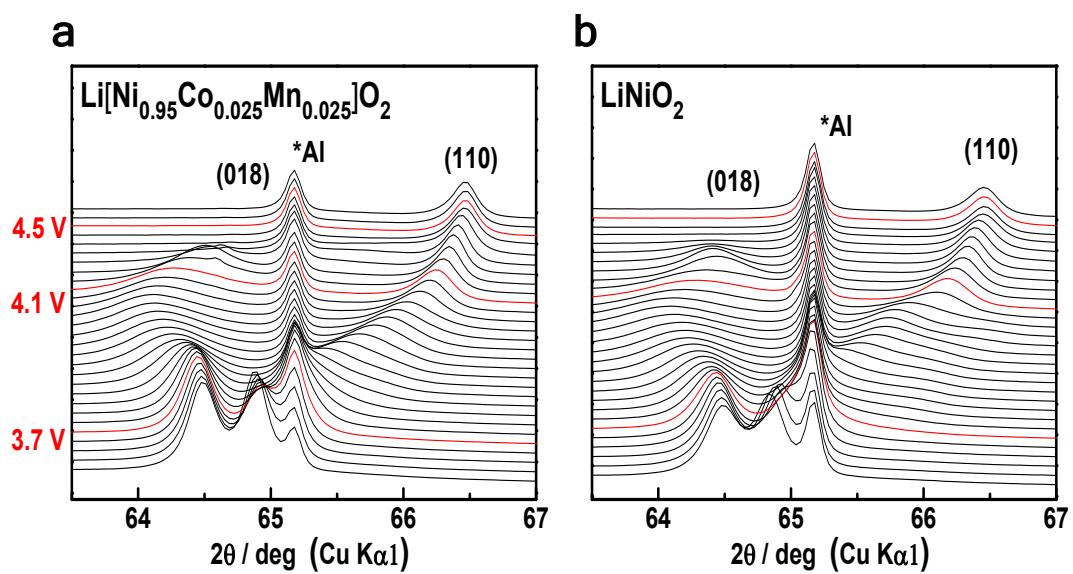


Fig S2. In-situ XRD patterns of (a) $\text{Li}[\text{Ni}_{0.95}\text{Co}_{0.025}\text{Mn}_{0.025}]\text{O}_2$ and (b) LiNiO_2 during the first charge process showing the positive shift of the (110) peak during charging.

Table S1. The electrochemical performance of Li[Ni_xCo_yMn_{1-x-y}]O₂ in lithium half-cell reported in the literature

Sample	0.1C discharge capacity / mAh g ⁻¹	0.5C discharge capacity / mAh g ⁻¹	retention at 100 th cycle / %	Ref
Li[Ni _{0.95} Co _{0.025} Mn _{0.025}]O ₂	238.0	221.5	85.1	In this study 2.7-4.3 V at 30 °C
LiNiO ₂	247.8	235.5	74.3	
Li[Ni _{0.95} Co _{0.025} Mn _{0.025}]O ₂	229.7	208.1	75.4	J. Electrochem. Soc. 2015, 162, A2483-2489 2.7-4.3 V at 30 °C
LiNiO ₂	242.4	216.0	70.1	
LiNiO ₂	247.5	232.5	73.7	Chem. Mater. 2017, 29, 5048-5052 2.7-4.3 V at 30 °C
LiNiO ₂	246.6	234.2	75.2	ACS Energy Lett. 2017, 2, 1150-1155
Li[Ni _{0.95} Co _{0.025} Mn _{0.025}]O ₂	234.9	218.7	84.3	Chem. Mater [DOI: 10.1021/acs.chemmater.7b05269] 2.7-4.3 V at 25 °C
LiNiO ₂	246.1	231.0	74.9	