

Supporting Information

Factors Affecting Cycling Life of $\text{LiNi}_{0.8}\text{Co}_{0.15}\text{Al}_{0.05}\text{O}_2$ for Lithium-Ion Batteries

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Table S1. Summary on the compositions of the samples, $\text{Li}_z\text{Ni}_{0.8}\text{Co}_{0.15}\text{Al}_{0.05}\text{O}_{2-\delta}$ ($z = 0.8 - 1.05$), determined by inductively coupled plasma-atomic emission spectroscopy (ICP-AES).

z	Compositions [Liz(Ni,Co,Al)]			
	Li	Ni	Co	Al
1.05	1.042	0.810	0.144	0.046
1.02	1.002	0.809	0.145	0.046
1.00	0.989	0.810	0.144	0.046
0.98	0.960	0.811	0.144	0.046
0.95	0.938	0.810	0.144	0.046
0.9	0.886	0.810	0.144	0.046
0.8	0.787	0.809	0.145	0.047

Figure S1 SEM images of $\text{Li}_z\text{Ni}_{0.8}\text{Co}_{0.15}\text{Al}_{0.05}\text{O}_{2-\delta}$ corresponding to $[\text{Li}_{1-y}\text{Ni}_y]^{3(b)}[\text{Ni},\text{Co},\text{Al}]^{3(a)}\text{O}_2$ based on a space group of Rm ; y [z] = (a) 0.0023 [1.05], (b) 0.0607 [0.90], and (c) 0.1280 [0.80].

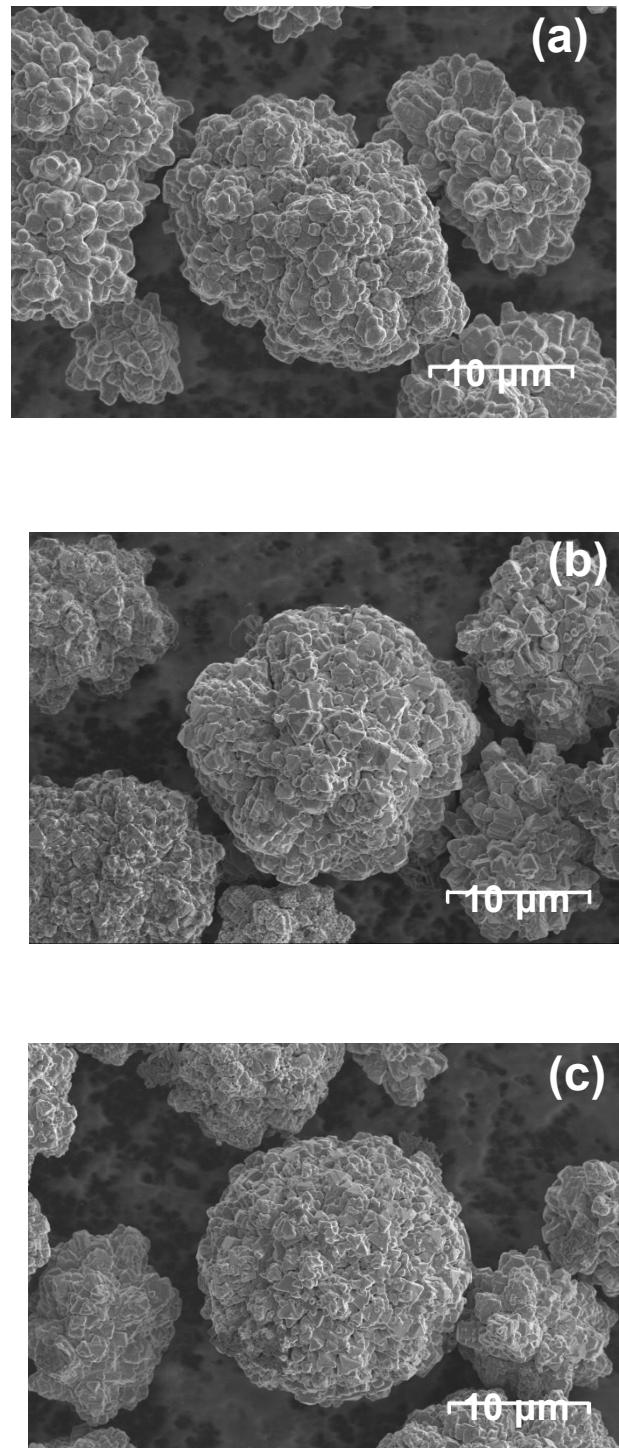


Figure S2 Co K-edge XANES spectra of $\text{Li}_z\text{Ni}_{0.8}\text{Co}_{0.15}\text{Al}_{0.05}\text{O}_{2-\delta}$ corresponding to $[\text{Li}_{1-y}\text{Ni}_y]^{3(b)}[\text{Ni},\text{Co},\text{Al}]^{3(a)}\text{O}_2$ based on a space group of Rm .

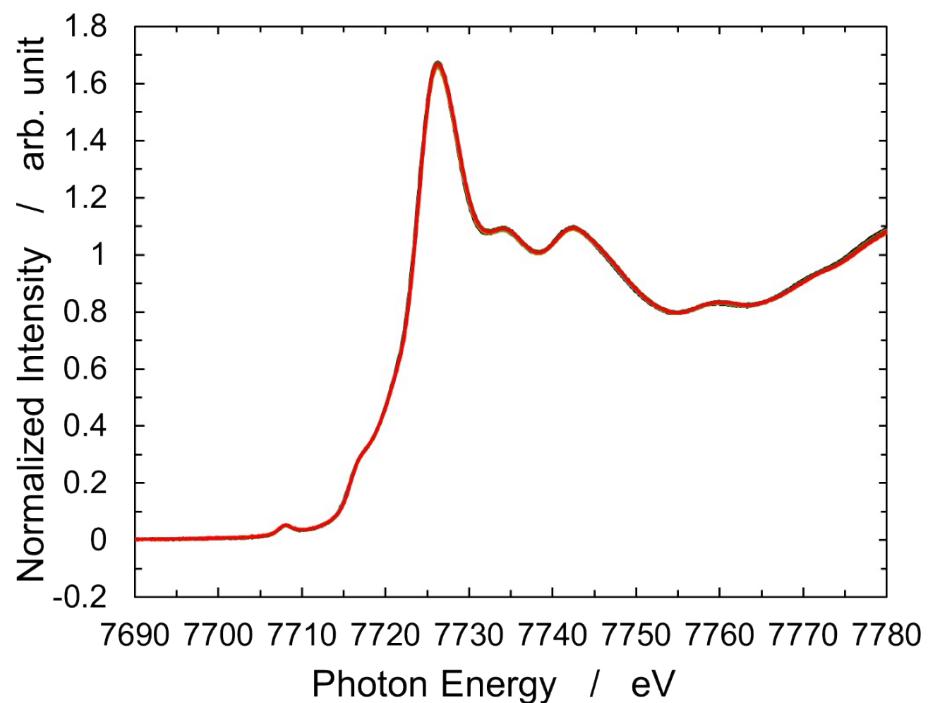


Figure S3 Intermittent charge and discharge curve of a lithium cell of $\text{Li}_z\text{Ni}_{0.8}\text{Co}_{0.15}\text{Al}_{0.05}\text{O}_{2-\delta}$ ($y = 0.0023$) at C/10-rate at 20 °C.

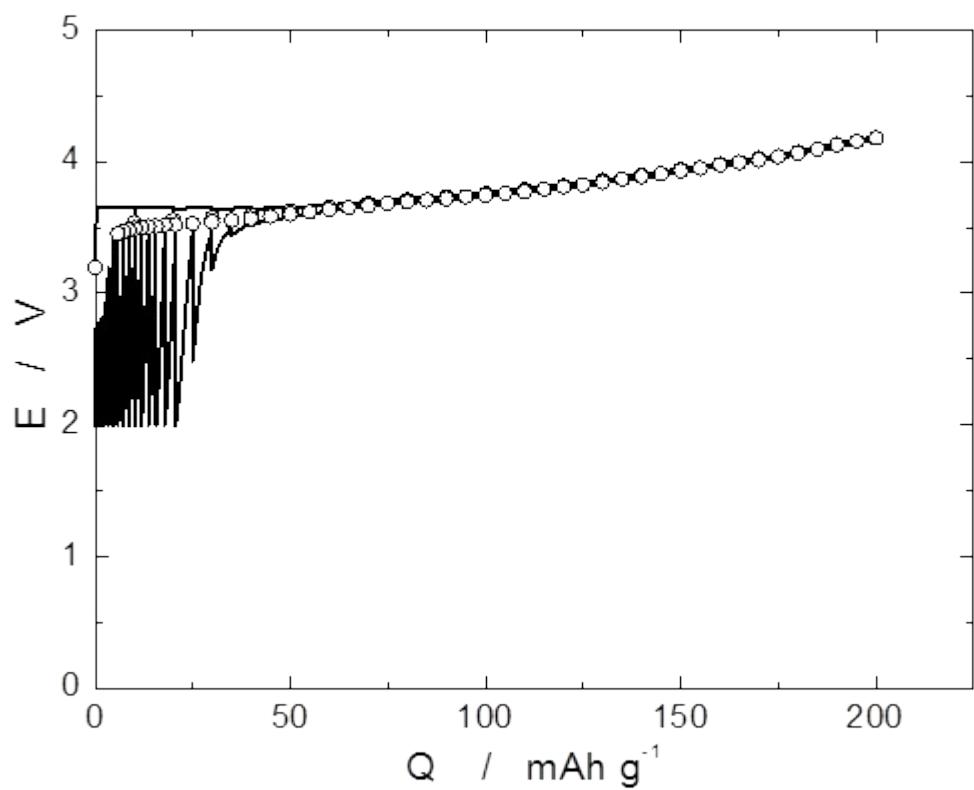


Figure S4 Voltage profiles of a lithium cell of $\text{Li}_z\text{Ni}_{0.8}\text{Co}_{0.15}\text{Al}_{0.05}\text{O}_{2-\delta}$ ($y = 0.0023$) operated in a 200 mAh g^{-1} capacity-limited mode at C/10-rate at (a) 20, (b) 60, or (c) 80°C.

