

Supporting Information for

Li₂Ni_{0.2}Co_{1.8}O₄ having a Spinel Framework as Zero-Strain Positive Electrode Material for Lithium-Ion Batteries

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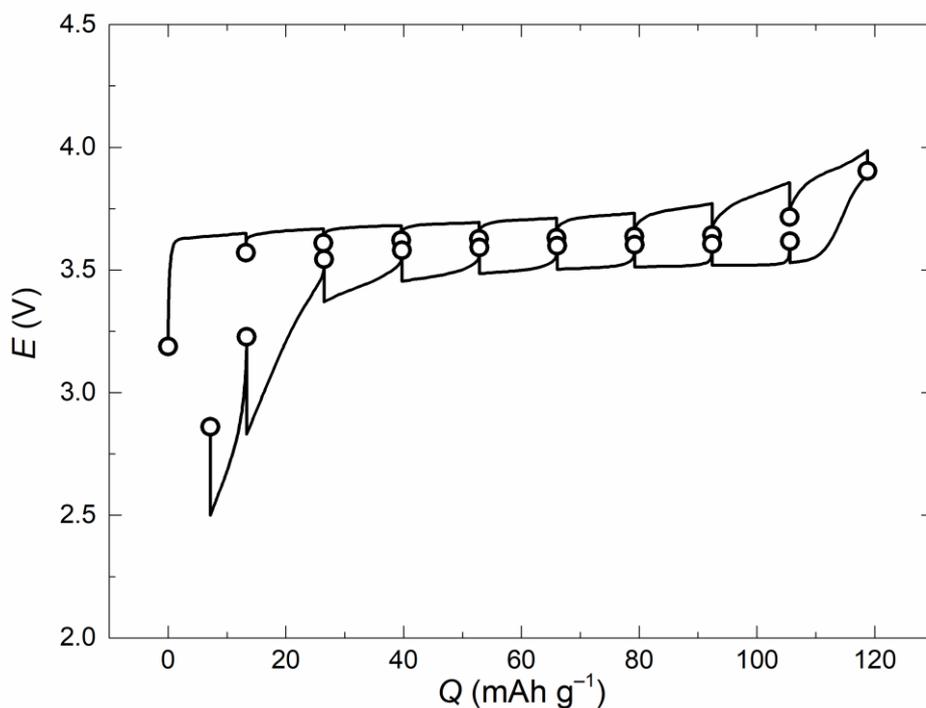


Fig. S1 Intermittent charge and discharge curves of a Li/Li₂Ni_{0.2}Co_{1.8}O₄ cell at a rate of 0.25 mA cm⁻² at 25°C to measure open-circuit voltages. Open circles indicate open-circuit voltages measured after the cell was open-circuited for 3 h.

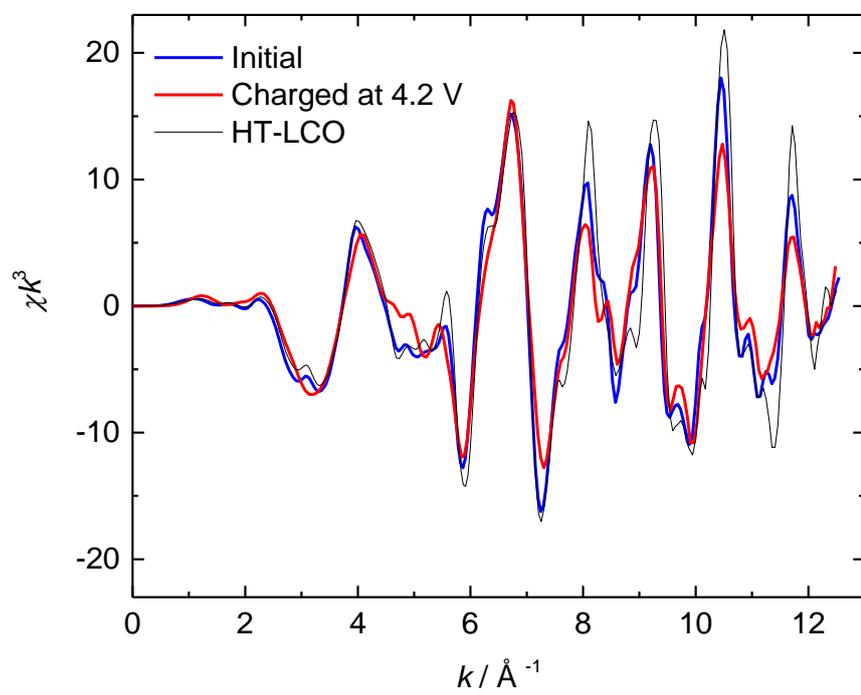


Fig. S2 Co K-edge EXAFS oscillations of $\text{Li}_2\text{Ni}_{0.2}\text{Co}_{1.8}\text{O}_4$ at the initial and charged states and LiCoO_2 (LCO).

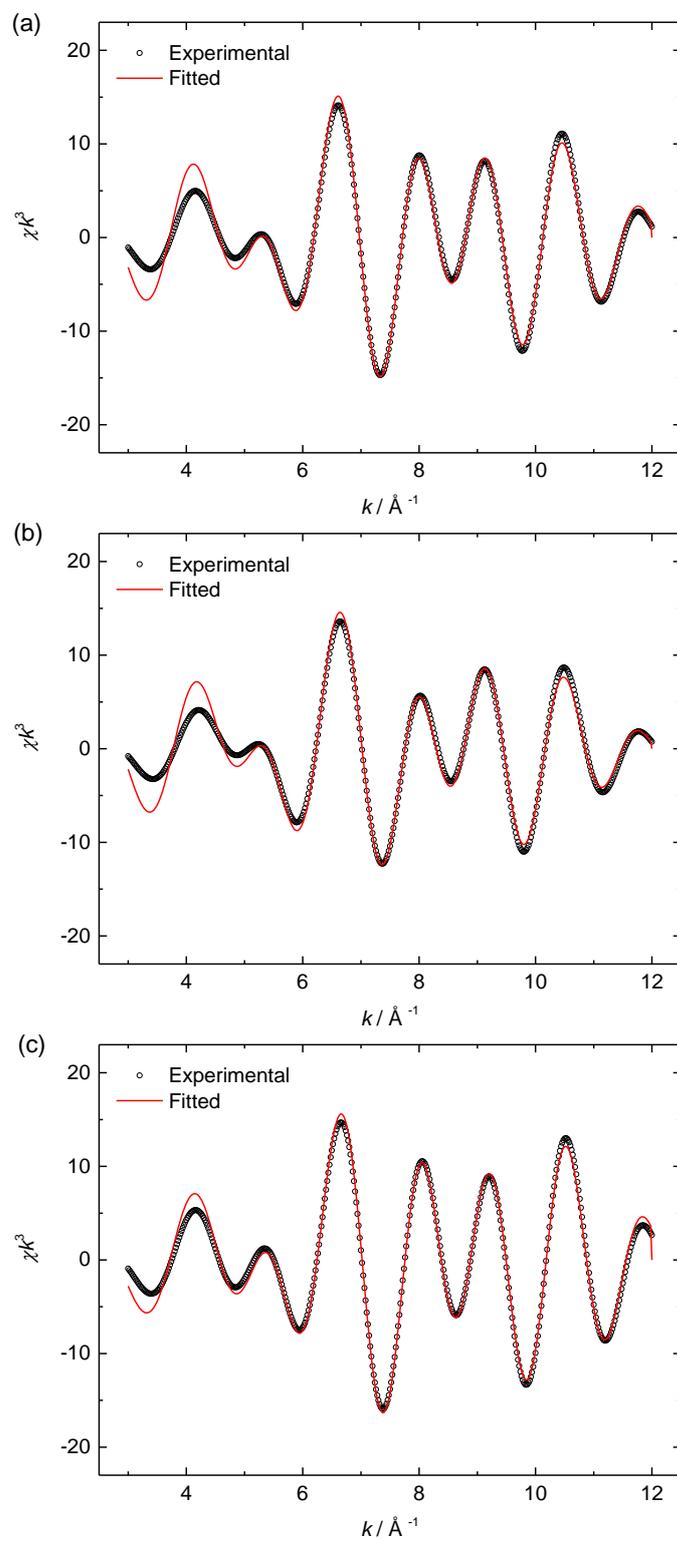


Fig. S3 Curve fitting in k -space of the Co K-edge EXAFS spectra of $\text{Li}_2\text{Ni}_{0.2}\text{Co}_{1.8}\text{O}_4$ at the (a) initial and (b) charged states and (c) LiCoO_2 .

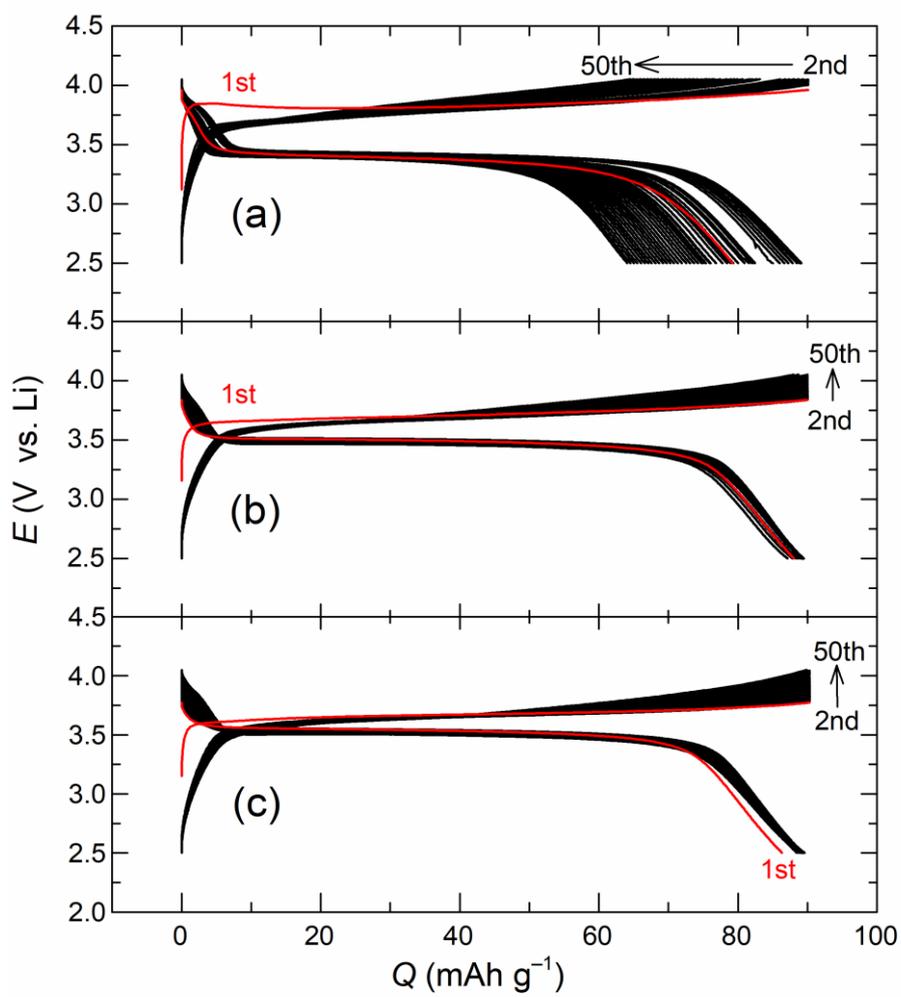


Fig. S4 Charge-discharge curves of Li/Li₂Ni_{0.2}Co_{1.8}O₄ cells for 50 cycles at a rate of (a) 1.29 mA cm⁻² (1 C-rate), (b) 0.45 mA cm⁻² (1/3 C-rate), or (c) 0.14 mA cm⁻² (1/9 C-rate).

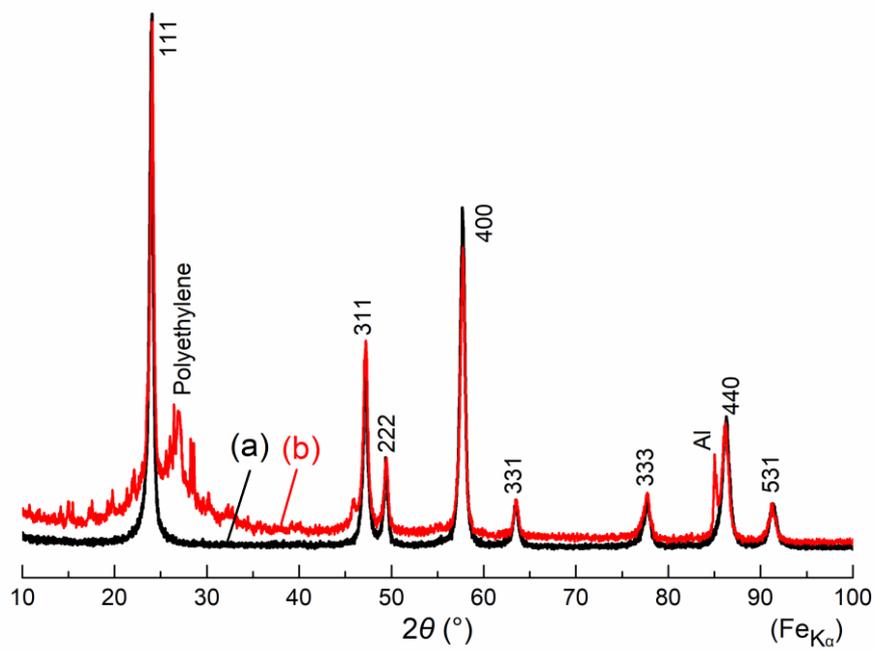


Fig. S5. XRD patterns of the $\text{Li}_2\text{Co}_{1.8}\text{Ni}_{0.2}\text{O}_4$ (a, black) before and (b, red) after the 50-cycle test shown in Figure S4(c).

Table S1 Refined local structural parameters from the Co K-edge EXAFS of $\text{Li}_2\text{Ni}_{0.2}\text{Co}_{1.8}\text{O}_4$ at the initial and charged states and LiCoO_2 (LCO).

	Co–O ($N^a = 6$)		Co–Co ($N^a = 6$)		R_f (%)
	$R^b/\text{\AA}$	$\sigma^c/\text{\AA}$	$R^b/\text{\AA}$	$\sigma^c/\text{\AA}$	
Initial	1.913(6)	0.078(10)	2.834(3)	0.074(5)	3.095
Charged at 4.2 V	1.895(5)	0.080(9)	2.838(4)	0.081(5)	4.294
HT-LCO	1.908(6)	0.076(11)	2.813(3)	0.071(5)	1.354

^a N , coordination number of neighbors. ^b R , interatomic bond distance. ^c σ , Debye-Waller factor. ^d R_f , fitting quality.