Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information

Table S1. Synthesis conditions for the SC-LNO samples.

Molten-salt	R ratio	Lithium precursor (mole)	Nickel precursor (mole)	Synthesis Temp. (°C)	Annealing Temp. (°C)	Sample obtained
Li_2SO_4 : LiOH (4:1)	2	1	1	750	700	Cubic-SC-LNO
KCl : LiCl (3:2)	4	2	1	750	700	Oct-SC-LNO
CsCl	1.56	2	1	750	700	T-poly-SC-LNO

Table S2. Additional Rietveld refinement results of the SC-LNO XRD patterns.

Cubic-SC-LNO	$LiNiO_2$ ($R\bar{3}m$), a=b=2.8793(6)Å, c=14.2035(4)Å, V=101.977(4)Å^3, R=1.32				
	x	***y***	***z***	**B**	**Occ.**
Li	0	0	0	7.51828	2.84420
Ni	0	0	0	7.51828	0.15580
Ni	0	0	0.5	4.77290	2.84420
Li	0	0	0.5	4.77290	0.15580
O	0	0	0.24209	6.29250	6.00000
Oct-SC-LNO	$LiNiO_2$ ($R\bar{3}m$), a=b=2.8792(5)Å, c=14.2081(3)Å, V=102.002(3)Å^3, R=3.38				
	x	***y***	***z***	**B**	**Occ.**
Li	0	0	0	7.69419	2.82196
Ni	0	0	0	7.69419	0.17804
Ni	0	0	0.5	4.97626	2.82196
Li	0	0	0.5	4.97626	0.17804
O	0	0	0.24277	6.22367	6.00000
T-poly-SC-LNO	$LiNiO_2$ ($R\bar{3}m$), a=b=2.8788(3)Å, c=14.2028(3)Å, V=101.932(3)Å^3 , R=2.02				
	x	***y***	***z***	**B**	**Occ.**
Li	0	0	0	8.39519	2.85358
Ni	0	0	0	8.39519	0.14642
Ni	0	0	0.5	4.61558	2.85358
Li	0	0	0.5	4.61558	0.14642
O	0	0	0.24122	6.46622	6.00000

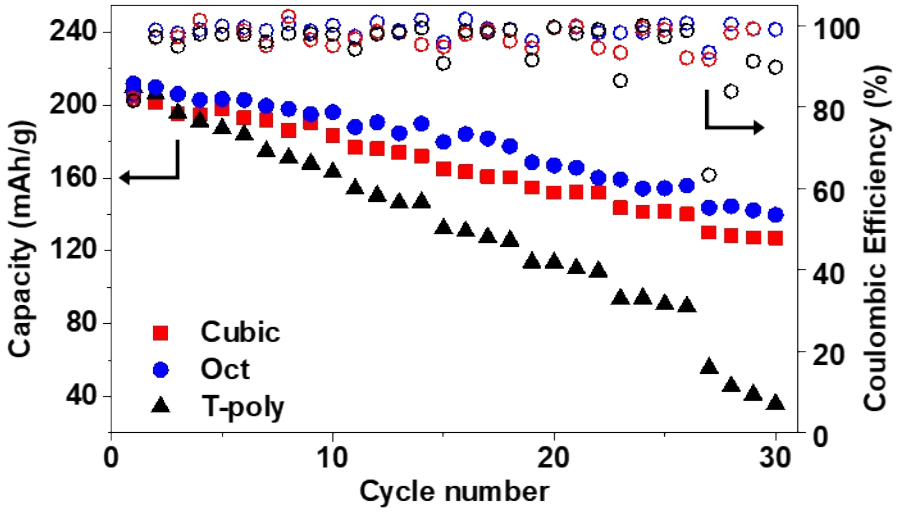

Figure S1. Comparison of cathode rate capability and the corresponding coulombic efficiency.

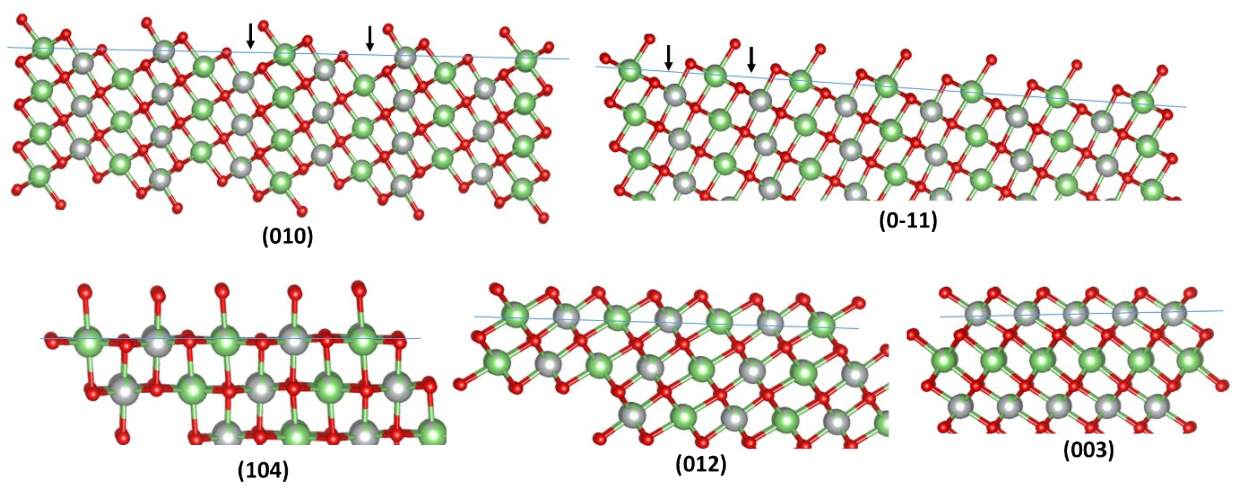

Figure S2. Atom arrangements of the various crystal planes.