

Table S3: Listed results of the refined parameters extracted from the Rietveld refinement of the cathode samples.

Phase	Refined Parameter	Fresh SoC 0%	Fresh SoC 100%	Cycled SoC 0%	Cycled SoC 100%
Li_{1-x}Mn₂O₄	a(Å)	8.21730(5)	8.17208(5)	8.20534(6)	8.14348(5)
	Phase_Fraction	0.264(4)	0.243(4)	0.230(3)	0.248(4)
	Weight_Fraction	0.869(2)	0.874(2)	0.868(2)	0.874(2)
	Uiso (all atoms)	0.0180(2)	0.0188(2)	0.0166(2)	0.0158(2)
	O1_x	0.26332(8)	0.26335(9)	0.26329(8)	0.26343(9)
Graphite	a(Å)	2.463(2)	2.46(3)	2.459(2)	2.463(3)
	c(Å)	6.7181(8)	6.722(7)	6.7161(7)	6.7149(7)
	Phase_Fraction	0.711(5)	0.708(4)	0.753(4)	0.701(5)
	Weight_Fraction	0.078(2)	0.086(2)	0.095(2)	0.084(2)
LiNaSO₄	a(Å)	7.631(4)	7.636(5)	7.630(3)	7.626(4)
	c(Å)	9.866(4)	9.875(5)	9.863(3)	9.867(5)
	Phase_Fraction	0.0113(6)	0.0067(6)	0.016(5)	0.0077(6)
	Weight_Fraction	0.0194(9)	0.013(1)	0.031(1)	0.015(2)
Li₂SO₄(H₂O)	a(Å)	5.45(3)	5.458(6)	-	5.451(6)
	b(Å)	4.868(5)	4.877(2)	-	4.869(2)
	c(Å)	8.19(6)	8.18(2)	-	8.18(2)
	Phase_Fraction	0.008(2)	0.042(2)	-	0.044(2)
	Weight_Fraction	0.0045(8)	0.027(2)	-	0.028(2)
Na₃Li(SO₄)₂(H₂O)₆	a(Å)	8.447(3)	-	8.449(8)	-
	c(Å)	30.261(7)	-	30.29(3)	-
	Phase_Fraction	0.0056(3)	-	0.0010(2)	-
	Weight_Fraction	0.029(2)	-	0.006(9)	-
Rwp (%)		7.00	7.15	6.83	7.15