Supporting Information

Engineering hydrolytic stability and reversible O3/P3/OP2 transitions in O3-type sodium-ion battery cathodes through Cu^{2+} doping

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Table S1. Result of Rietveld refinement.

Sample	Space group	Lattice parameters (Å)		Na occupancy in lattice	Rwp	Rp	GOF
		a	c				
NFM325	R-3mH	2.94284 (3)	16.2454 (4)	0.791 (3)	1.56	1.09	1.82
NFCM3214	R-3mH	2.97503 (4)	15.9885 (4)	0.930 (5)	1.98	1.27	2.36

Table S2. ICP results of pristine powder.

Sample	**Na**	**Ni**	**Fe**	**Cu**	**Mn**
NFM325	0.99	0.3	0.2	0	0.5
NFCM3214	1.0	0.3	0.2	0.1	0.4

Comment [u]: ??

Table S3. ICP results of water-immersed powder.

Sample	**Na**	**Ni**	**Fe**	**Cu**	**Mn**
NFM325	0.25	0.3	0.2	0	0.5
NFCM3214	0.61	0.3	0.2	0.1	0.4

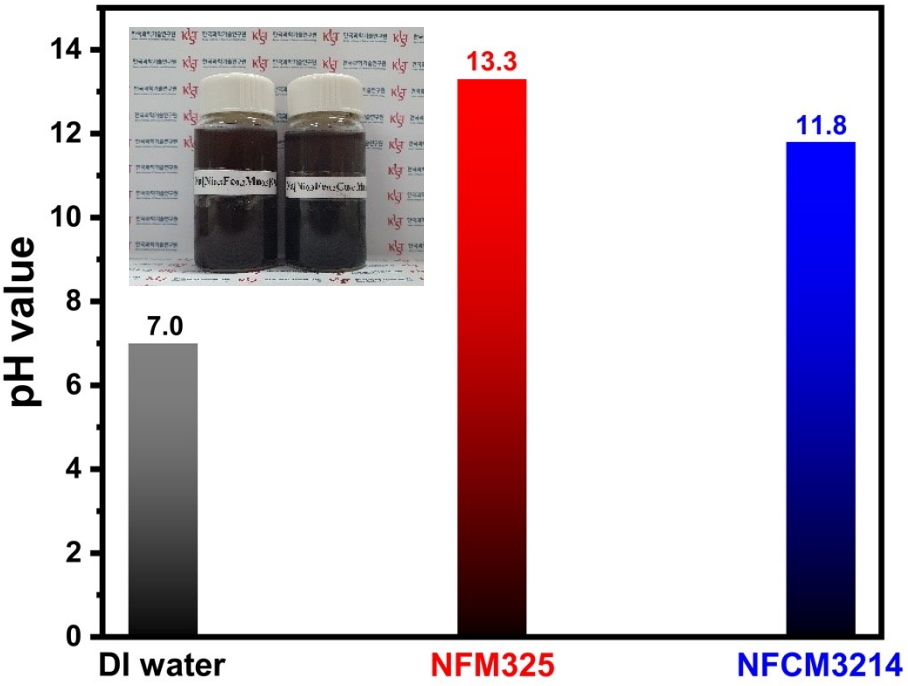

Figure S1. pH values and dissolved Na concentration in DI water of NFM325 and NFCM3214 samples after water soaking for 10 min.

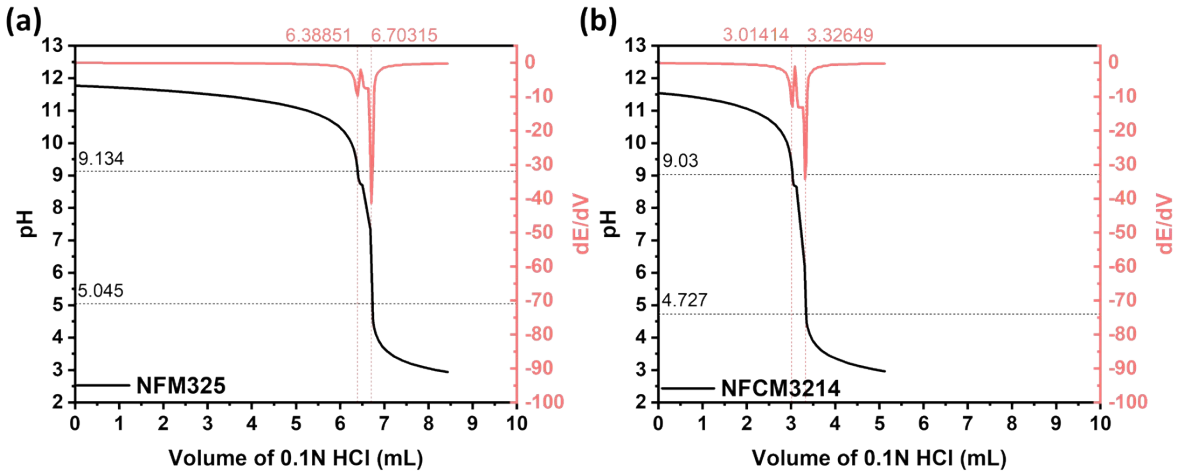

Figure S2. Titration curves and corresponding dE/dV profiles of (a) NFM325 and (b) NFCM3214. The first and second equivalence points represent NaOH and Na_2CO_3, respectively.

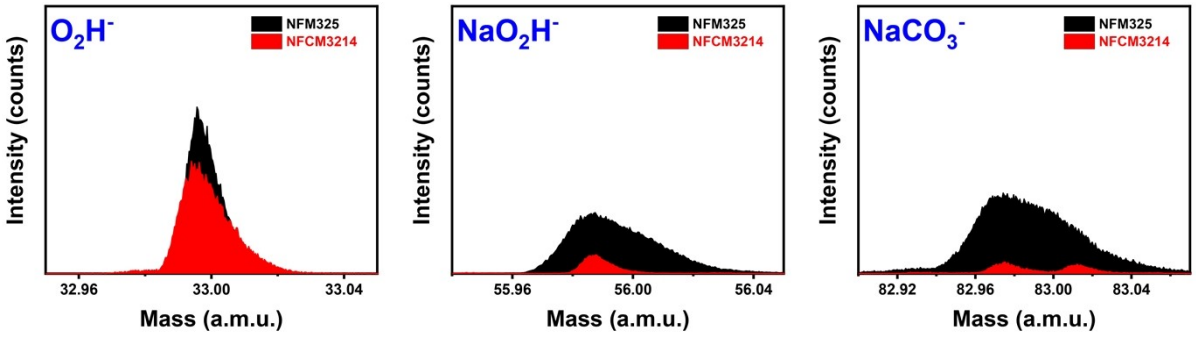

Figure S3. TOF-SIMS spectra of water-soaked NFM325 and NFCM3214 samples.

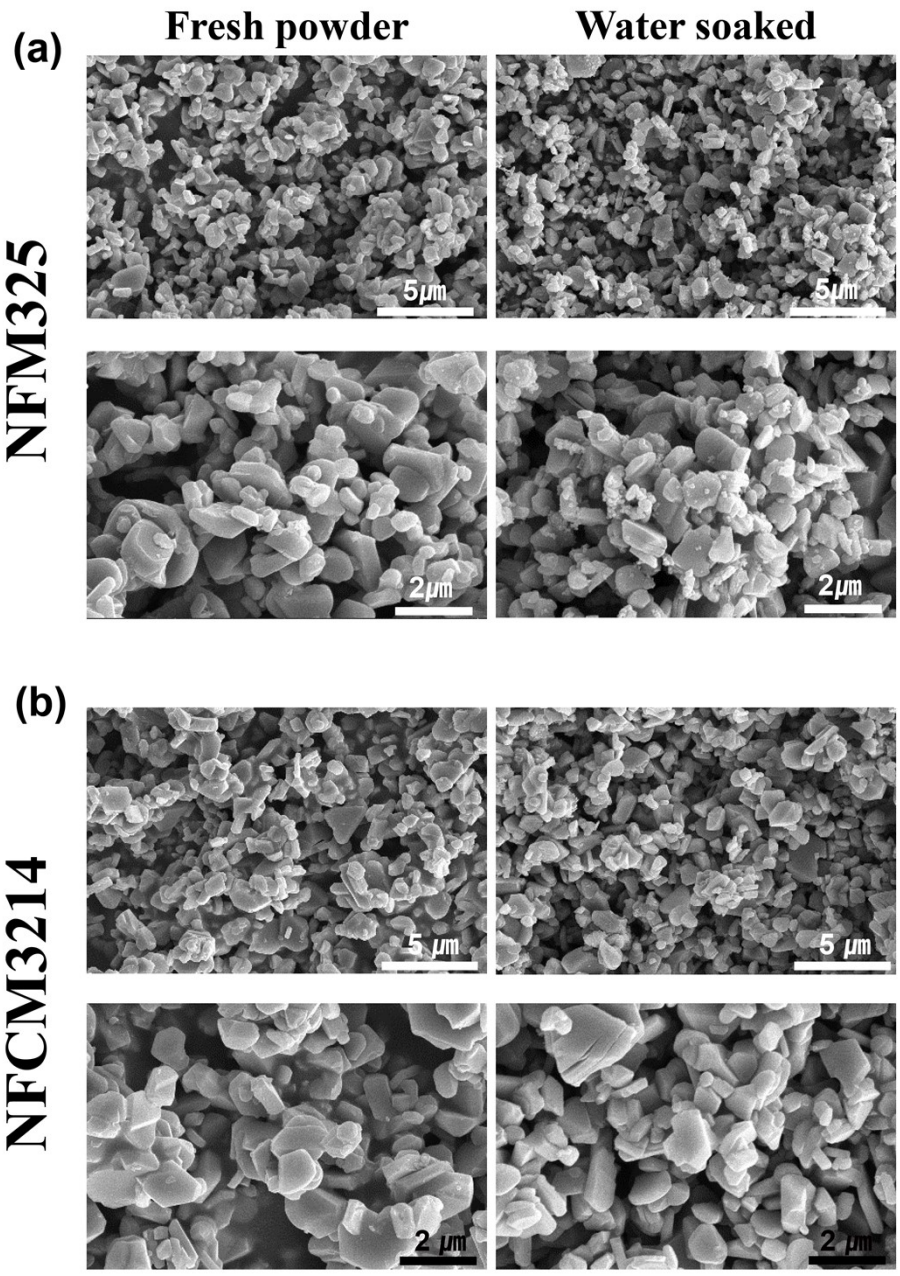

Figure S4. FE-SEM images of water-soaked and air-exposed (a) NFM325 and (b) NFCM3214 samples.

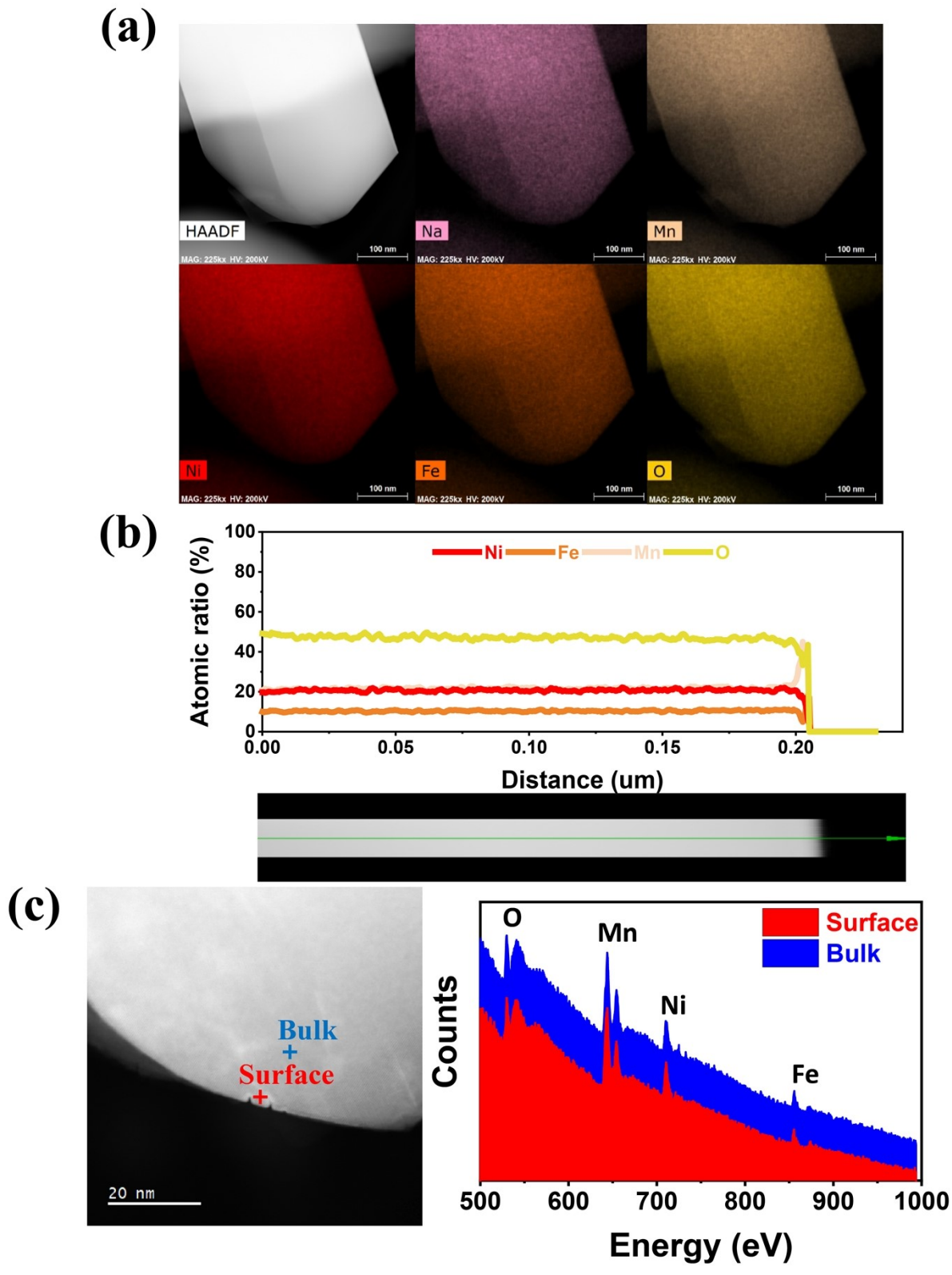

Figure S5. (a) EDS mapping, (b) line scanning, (c) STEM images, and EELS spectra of the fresh NFM325 sample.

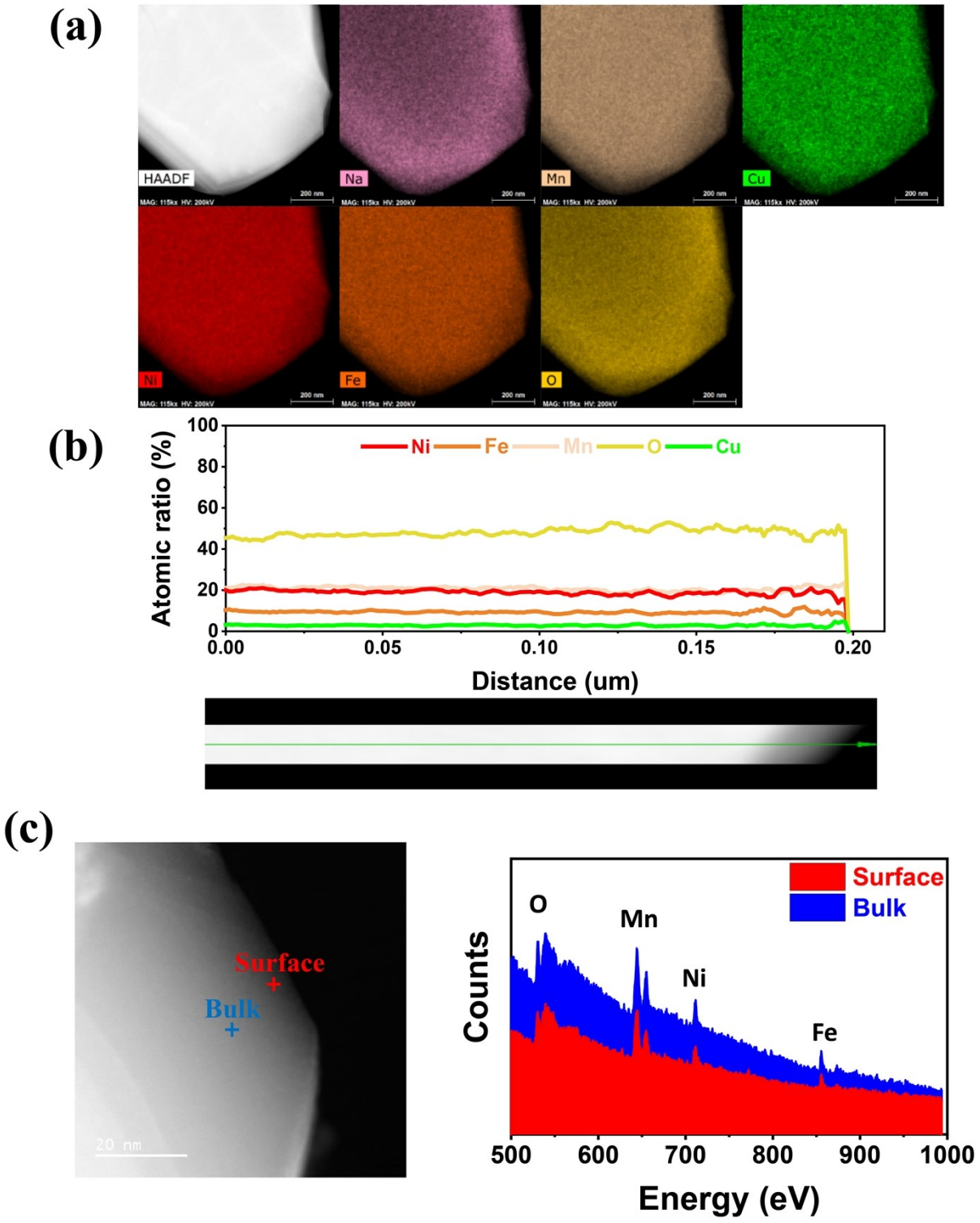

Figure S6. (a) EDS mapping, (b) line scanning, (c) STEM images, and EELS spectra of the fresh NFCM3214 sample.

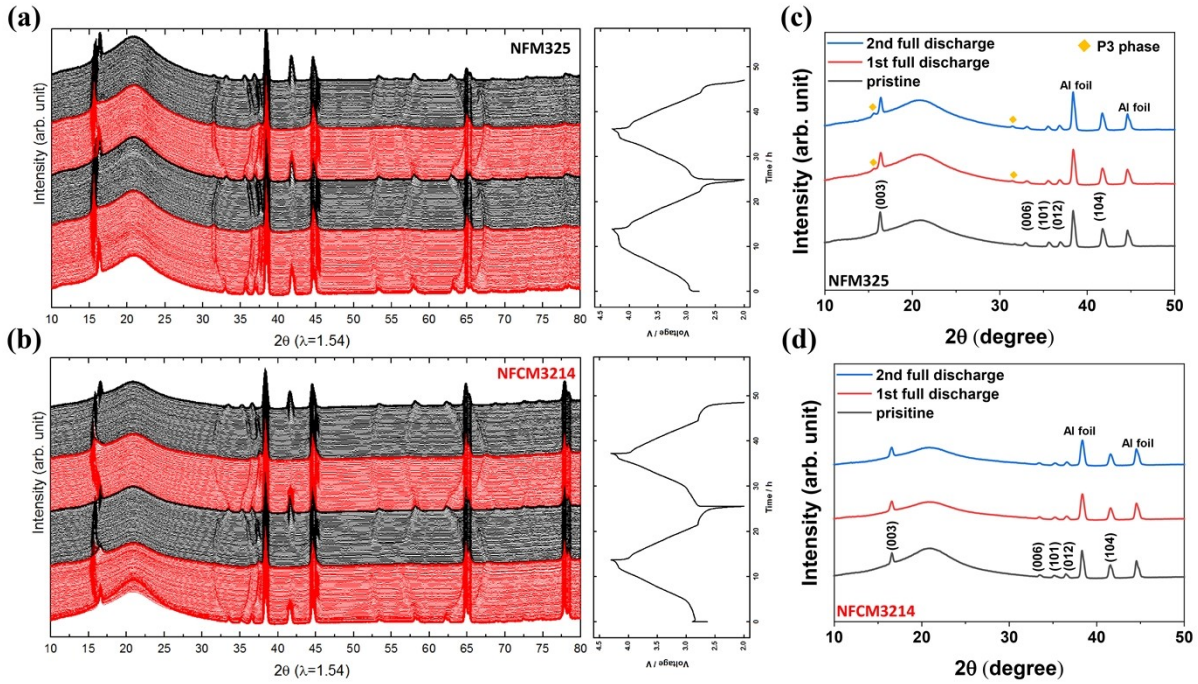

Figure S7. *In situ* XRD patterns of (a) NFM325 and (b) NFCM3214 for 2 cycles. *In situ* XRD patterns of (c) NFM325 and (d) NFCM3214 before cycle, after the first full discharge, and after the second full discharge.

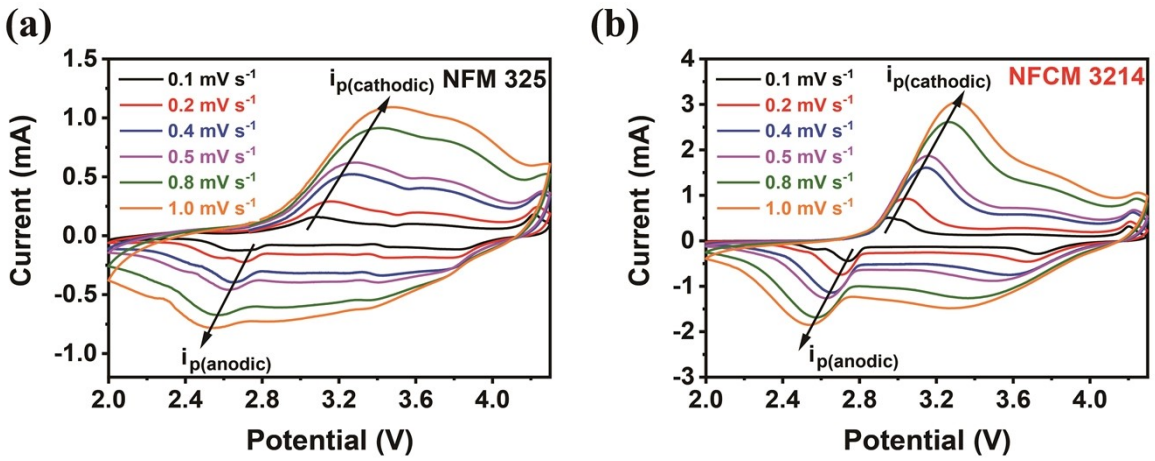

Figure S8. Kinetic analyses of the electrochemical behavior towards Na^+ of CV profiles at various scan rates (0.1, 0.2, 0.4, 0.5, 0.8, 1.0 mV s^{-1}) after formation cycles at 0.1 mV s^{-1} (a) NFM325 and (b) NFCM3214.

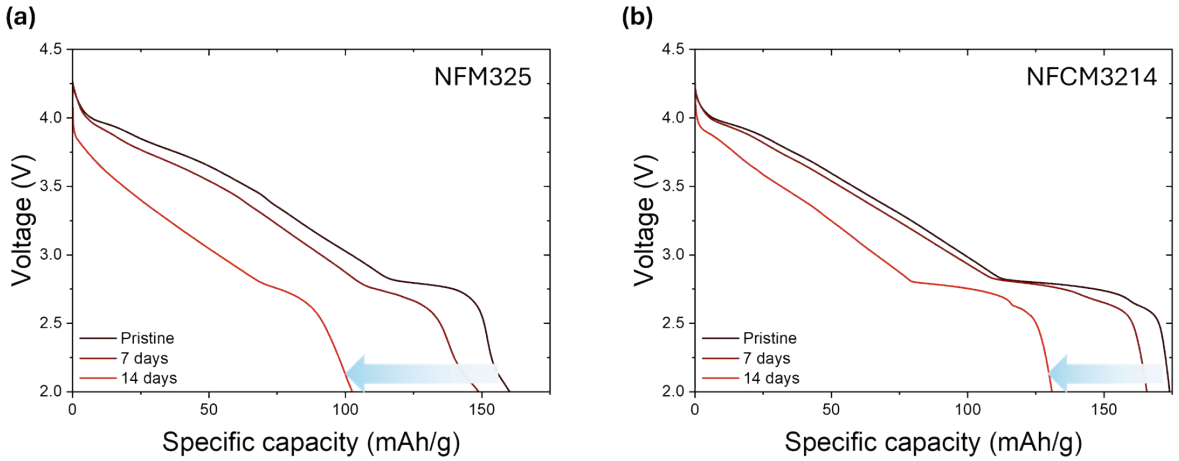

Figure S9. Discharge voltage profiles of (a) NFM325 and (b) NFCM3214 after storage at 70 °C and 80% relative humidity for 7 and 14 days.

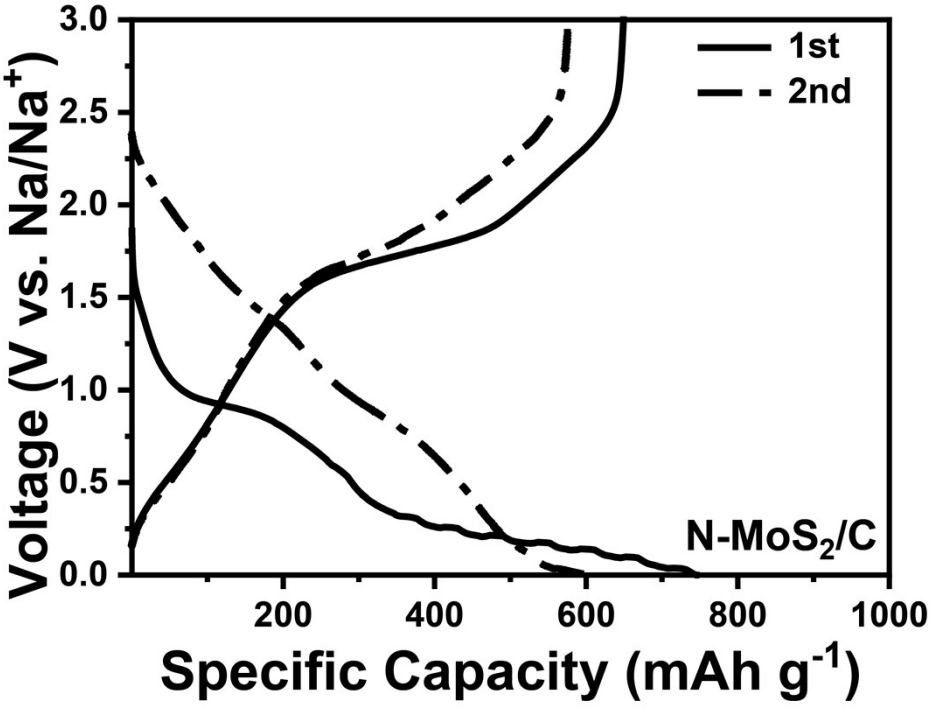

Figure S10. Charge/discharge voltage profiles of MoS_2/C at 1st and 2nd cycle between 3.0 and 0.001 V versus Na/Na^+ 0.1 C-rate.