Section S1 Details on the residual alkali titration method:

To ensure reliable data, the stirring time was determined based on changes in pH, and each sample was tested three times, with the average value reported. For titration, 5 g of NCA material and 20 mL of pure water were used in each test. Considering the alkaline nature of Na_2CO_3 and NaOH, a two-step titration method was developed using 0.1 mol/L HCl with phenolphthalein and methyl red as indicators. The values in Figure 1b were calculated using Equations (1) and (2), where $V1$ (mL) represents the volume of HCl used in the first step with phenolphthalein, $V2$ (mL) is the total volume of HCl used in the two steps, and m (g) is the mass of the cathode material. Due to the high reactivity of sodium, residual alkali, formed from reactions with H_2O and CO_2 in air, cannot be completely eliminated.

$$NaCO_3\% = \frac{\frac{V_2 - V_1}{1000} \times C_{HCl} \times 105.99 \times 4}{m} \quad (1)$$

$$NaOH\% = \frac{\frac{2V_1 - V_2}{1000} \times C_{HCl} \times 39.997 \times 4}{m} \quad (2)$$

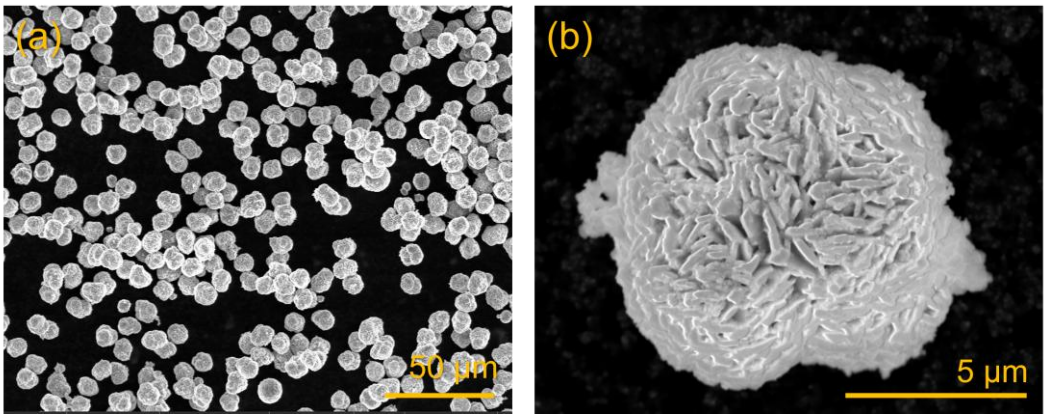

Figure S1 SEM images of the NFM-P materials.

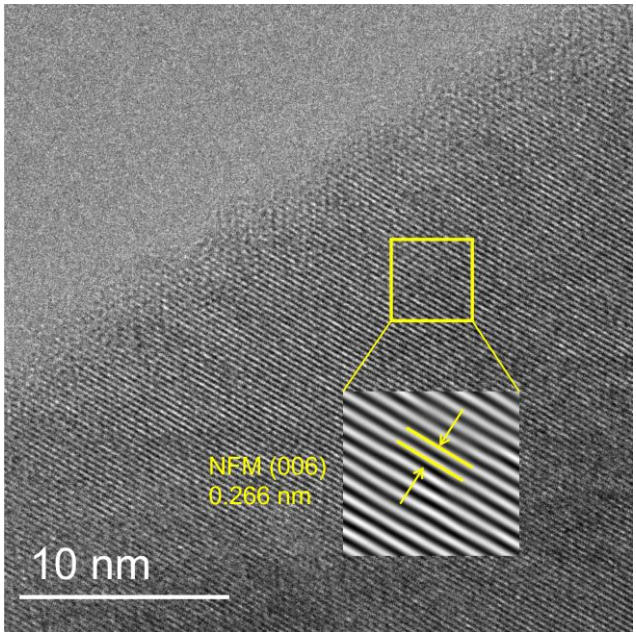

Figure S2 HRTEM image of the NFM-P materials

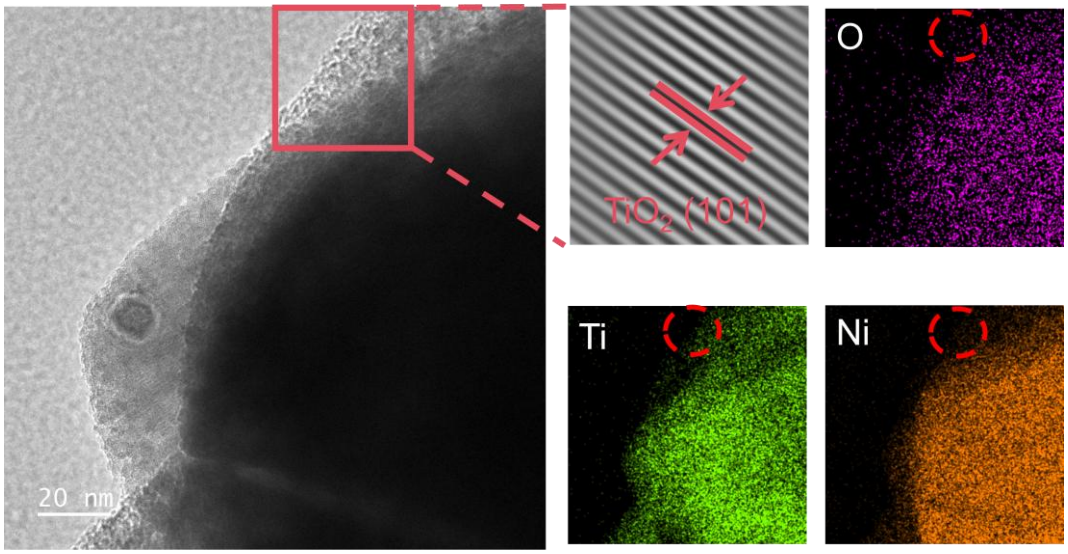

Figure S3 The TiO_2 regions observed in the TEM and EDS-Mapping images of the NFMT-B materials.

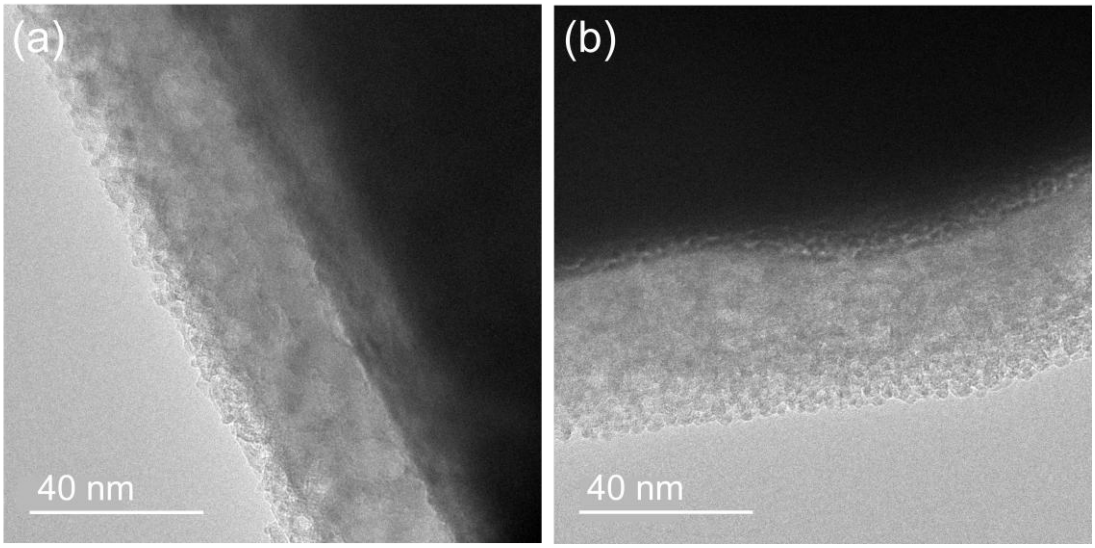

Figure S4 HRTEM image of the NFMT-L materials

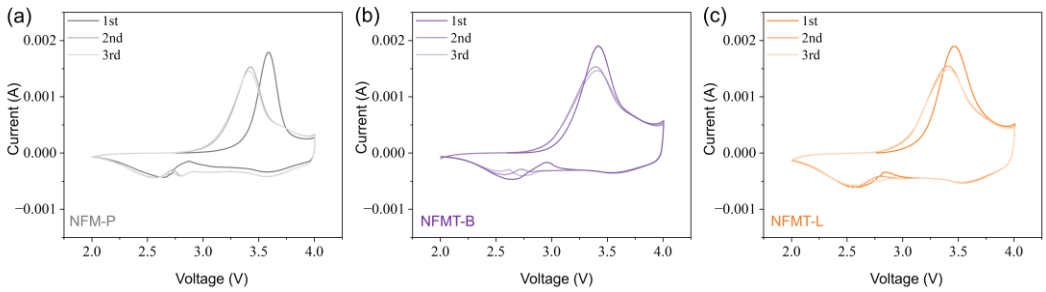

Figure S5 Cyclic voltammetry (CV) curves for the first three cycles of three cathodes.

Table S1 The Rietveld refinement XRD data of the NFM-P sample

	x	y	z	Occupancy
Na	0	0	0.5	0.9553
Ni	0	0	0	0.3239
Fe	0	0	0	0.3318
Mn	0	0	0	0.3303
Ti	0	0	0	0
O	0	0	0.267	1.0571
R_{wp}			0.0676	

Table S2 The Rietveld refinement XRD data of the NFMT-B sample.

	x	y	z	Occupancy
Na	0	0	0.5	0.9513
Ni	0	0	0	0.3219
Fe	0	0	0	0.3310
Mn	0	0	0	0.3264
Ti	0	0	0	0.0012
O	0	0	0.267	1.0577
$\boldsymbol{R}_{\mathbf{wp}}$			0.0699	

Table S3 The Rietveld refinement XRD data of the NFMT-L sample.

	x	y	z	Occupancy
Na	0	0	0.5	0.9486
Ni	0	0	0	0.3233
Fe	0	0	0	0.3307
Mn	0	0	0	0.3295
Ti	0	0	0	0.0010
O	0	0	0.266	1.0577
$\boldsymbol{R}_{\mathbf{wp}}$			0.0597	

Table S4 R_s and R_{ct} values of EIS fitting results

***R* (Ω)**	**NFM-P**	**NFMT-B**	**NFMT-L**
$\boldsymbol{R_s}$	5.893	5.625	5.474
$\boldsymbol{R_{ct}}$	1085.71	986	652.3