

# Supplementary Materials: Enhanced Electrochemical Performance of $\text{LiNi}_{0.5}\text{Mn}_{1.5}\text{O}_4$ Composite Cathodes for Lithium-Ion Batteries by Selective Doping of $\text{K}^+/\text{Cl}^-$ and $\text{K}^+/\text{F}^-$

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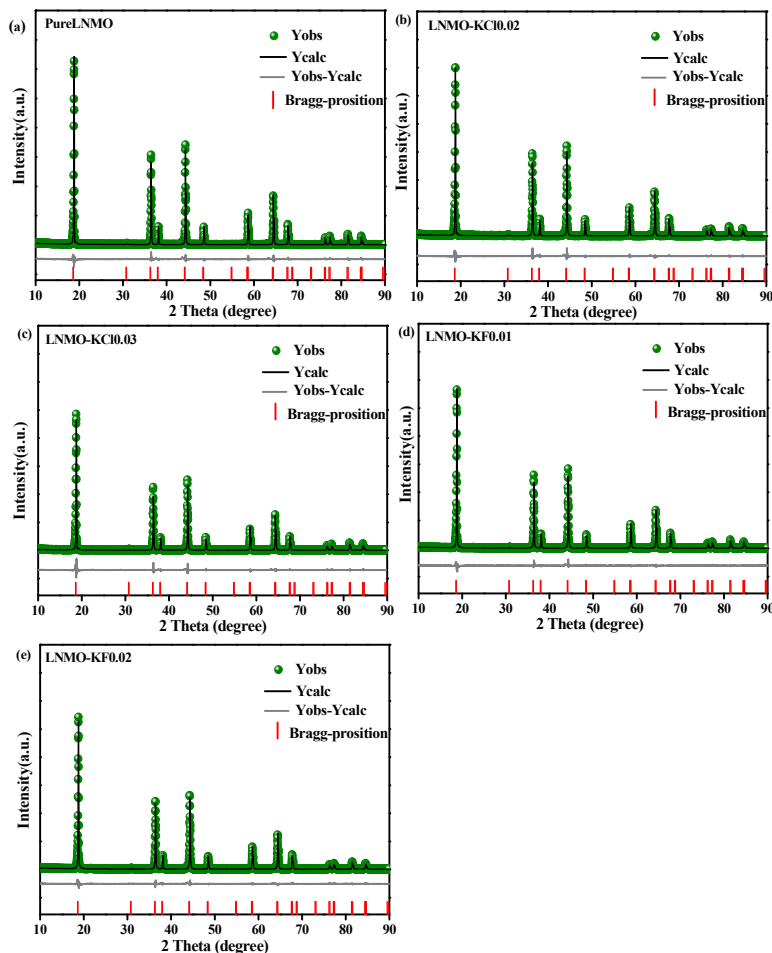
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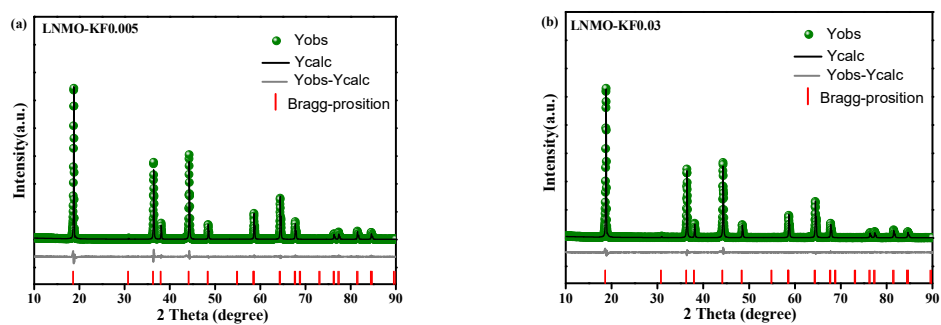
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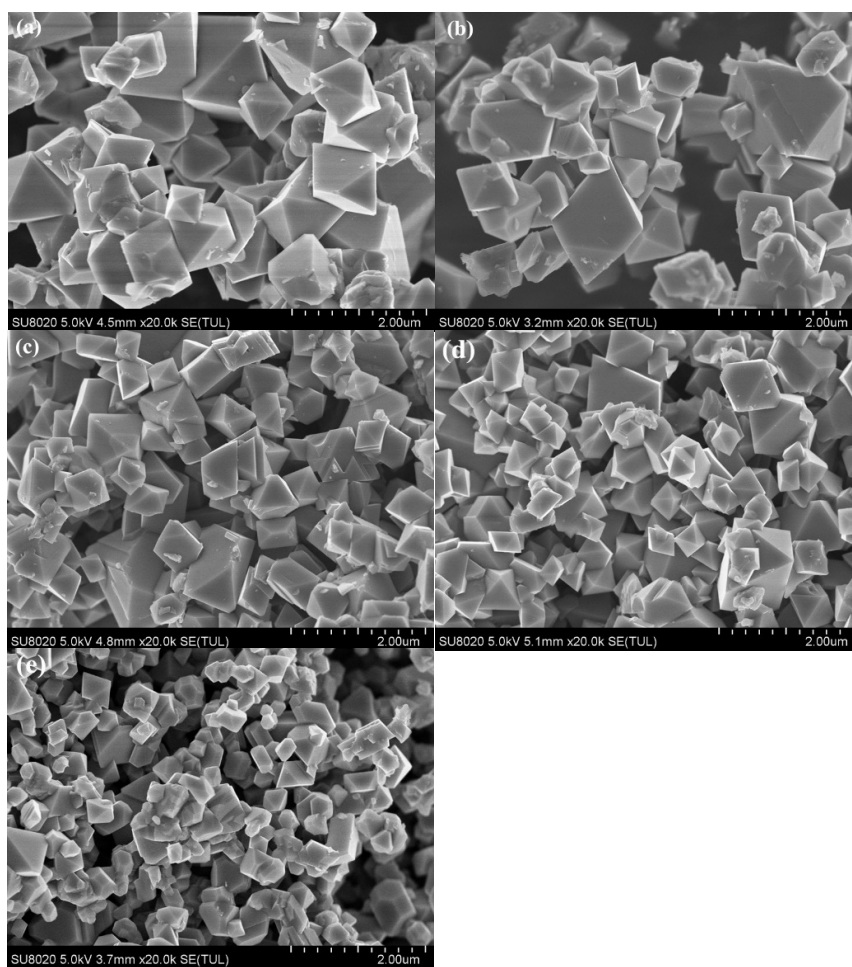
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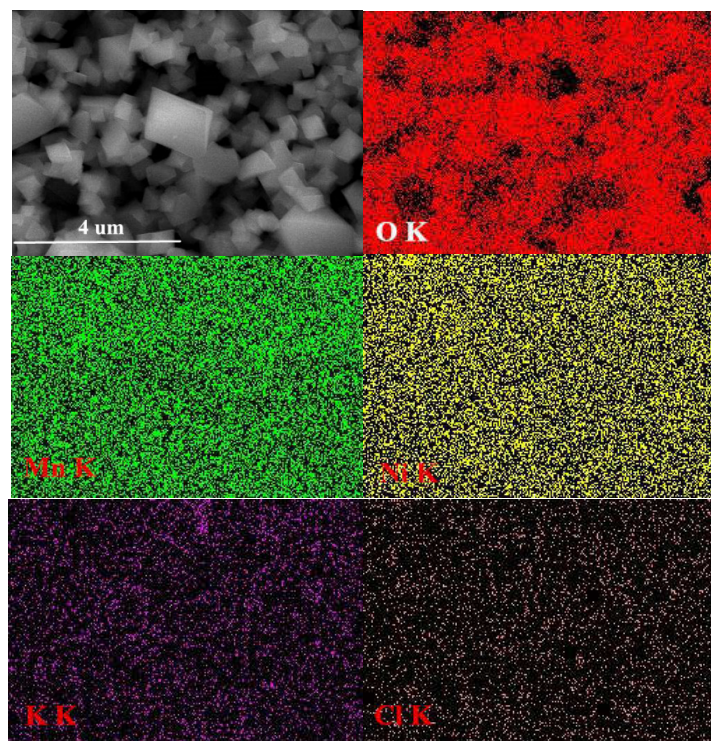
**Figure S1.** Rietveld refinement results of XRD patterns of pure LNMO (a), LNMO-KCl0.02 (b), LNMO-KCl0.03 (c), LNMO-KF0.01 (d), and LNMO-KF0.02 (e).



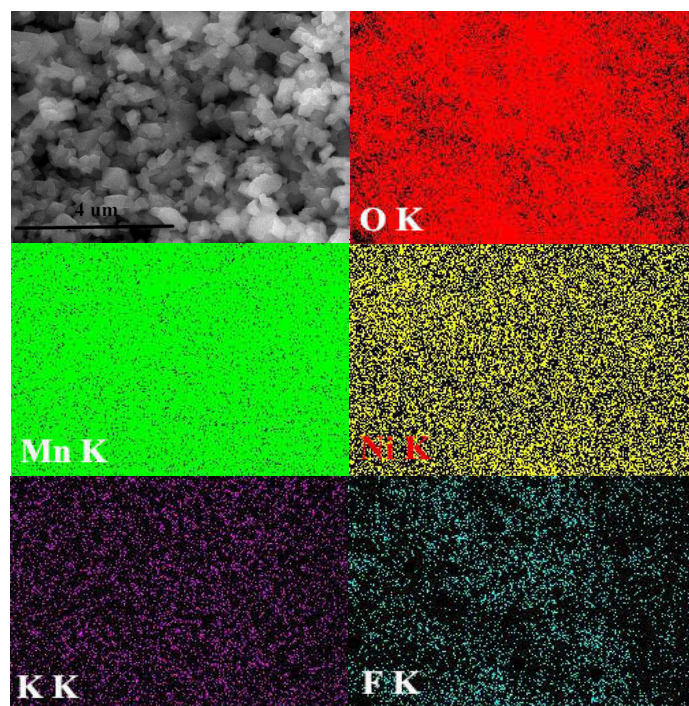
**Figure S2.** Rietveld refinement results of XRD patterns of LNMO-KF0.005 (a) and LNMO-KF0.03 (b).



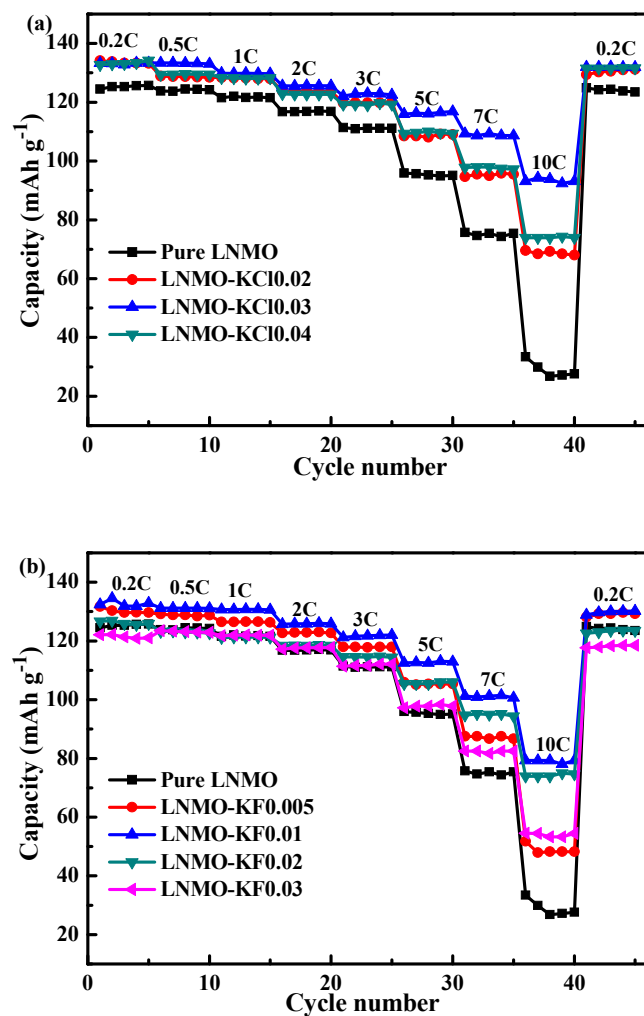
**Figure S3.** SEM images of pure LNMO (a), LNMO-KCl0.02 (b), LNMO-KCl0.03 (c), LNMO-KF0.01 (d), and LNMO-KF0.02 (e).



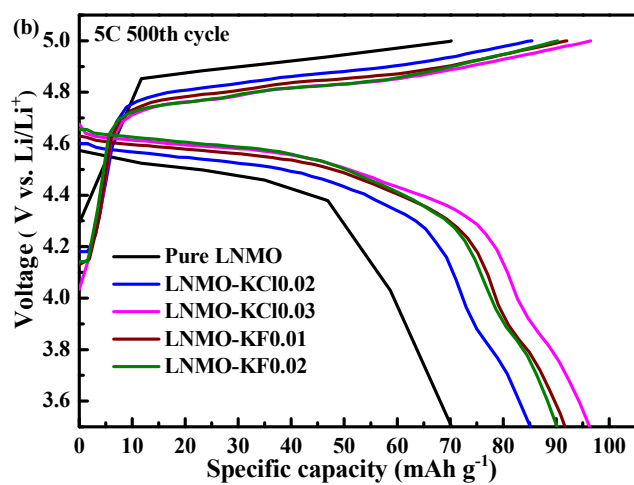
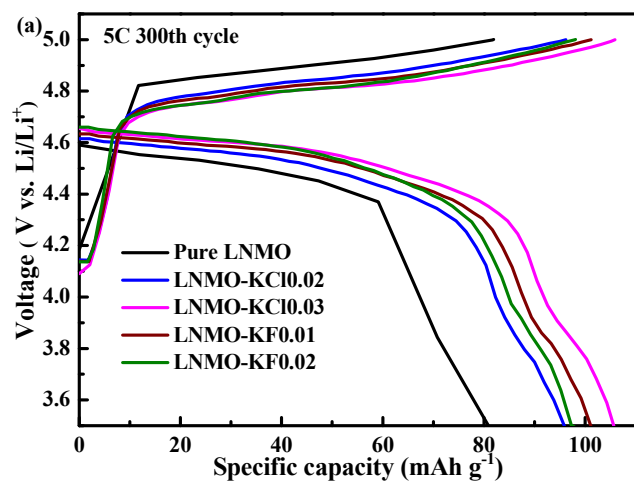
**Figure S4.** EDS images and the corresponding element mapping of O, Ni, Mn, K, and Cl for LNMO-KCl0.03.



**Figure S5.** EDS images and the corresponding element mapping of O, Ni, Mn, K, and F for LNMO-KF0.02.



**Figure S6.** Rate capability of the samples for pure LNMO, LNMO-KCl0.02, LNMO-KCl0.03, and LNMO-KCl0.04 from 0.2 C to 10 C (a); Rate capability of the samples for pure LNMO, LNMO-KF0.005, LNMO-KF0.01, LNMO-KF0.02, and LNMO-KF0.03 from 0.2 C to 10 C (b).



**Figure S7.** The charge/discharge curves of all the samples in the 300th cycle (a) and 500th cycle (b) at 5C.