Supplementary Information

Two-step solid-state synthesis of medium entropy $LiNi_{0.5}Mn_{1.5}O_4$ cathode with enhanced electrochemical performance

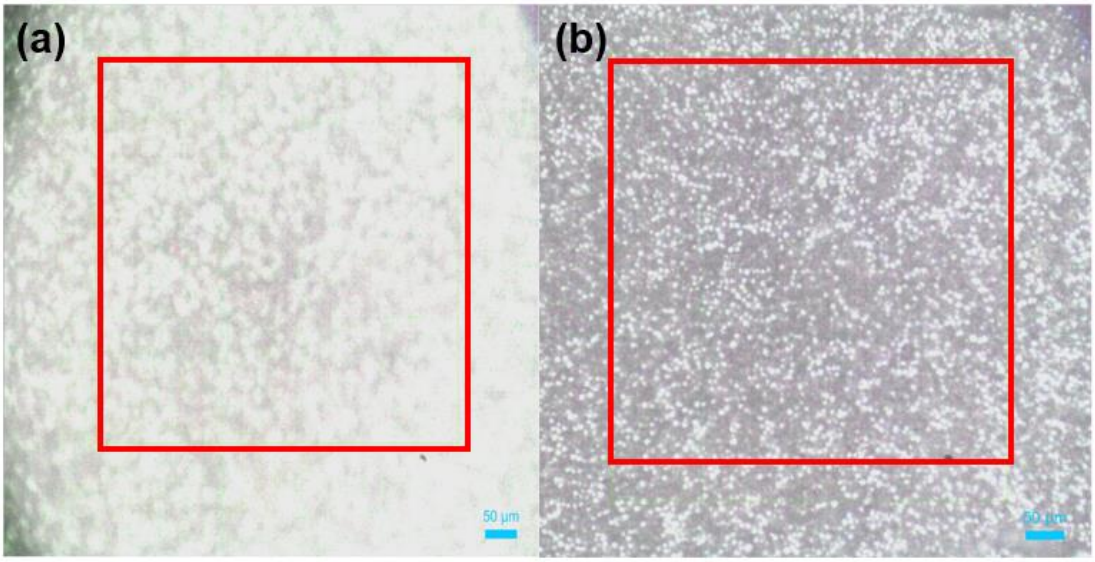

Figure S1. The optical image and Raman imaging selection region of (a) LNMO and (b) T-LNMO.

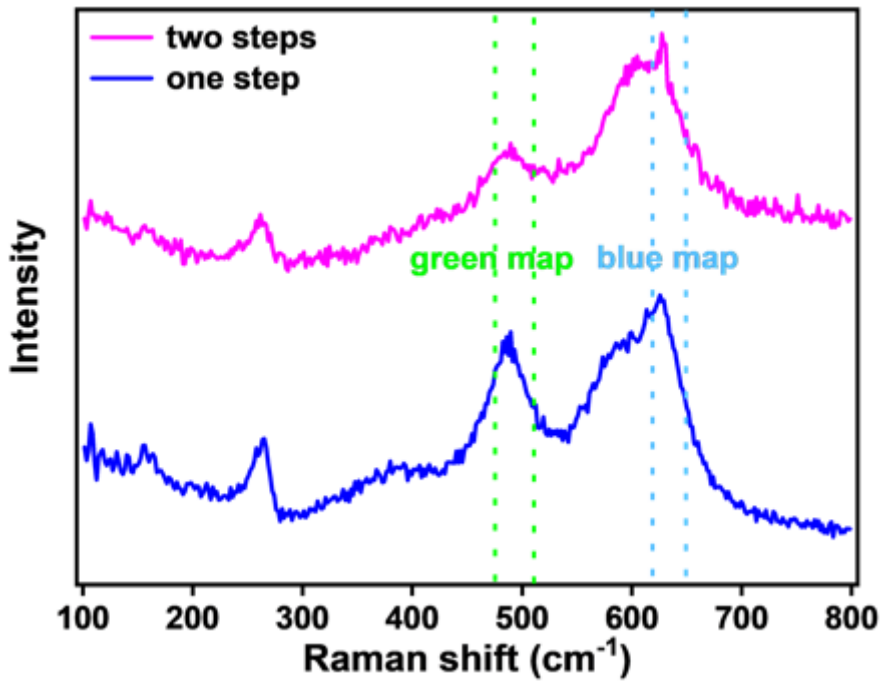

Figure S2. The green map area around 497 cm^{-1}, and the blue map area around 631 cm^{-1} in both samples.

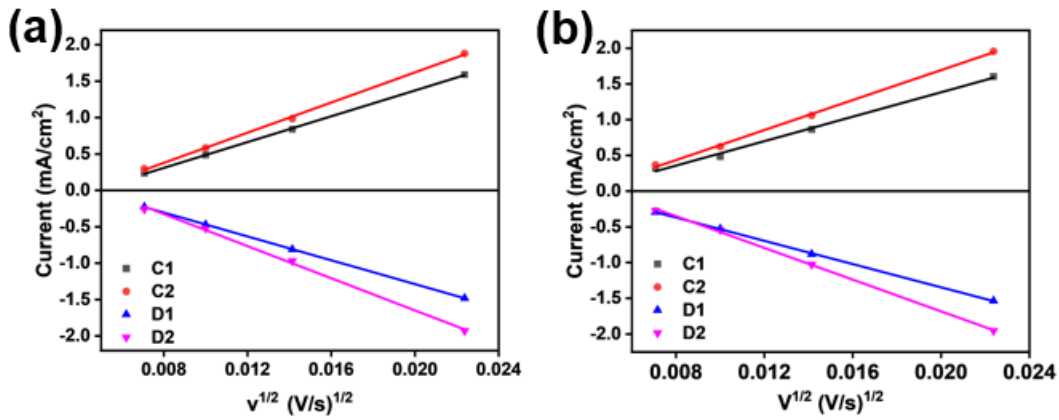

Figure S3. The relationships between the cathodic and anodic peak currents and the square root of the scan rate of (a) LNMO and (b) T-LNMO.

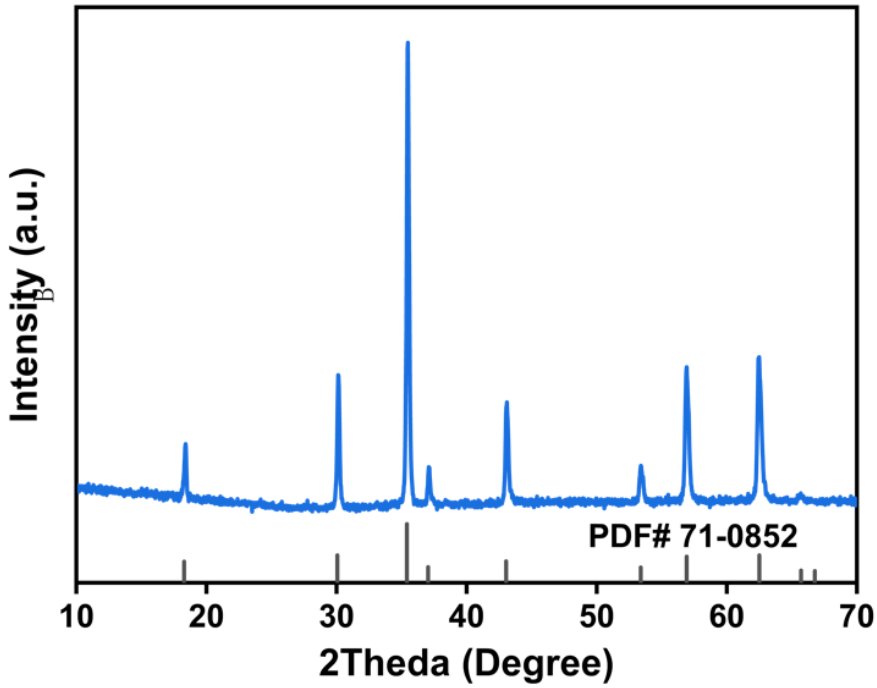

Figure S4. The XRD pattern of the multi-component precursor $Ni_{0.475}Co_{0.025}Cr_{0.025}Al_{0.025}Mn_{1.45}O_{4-x}$.

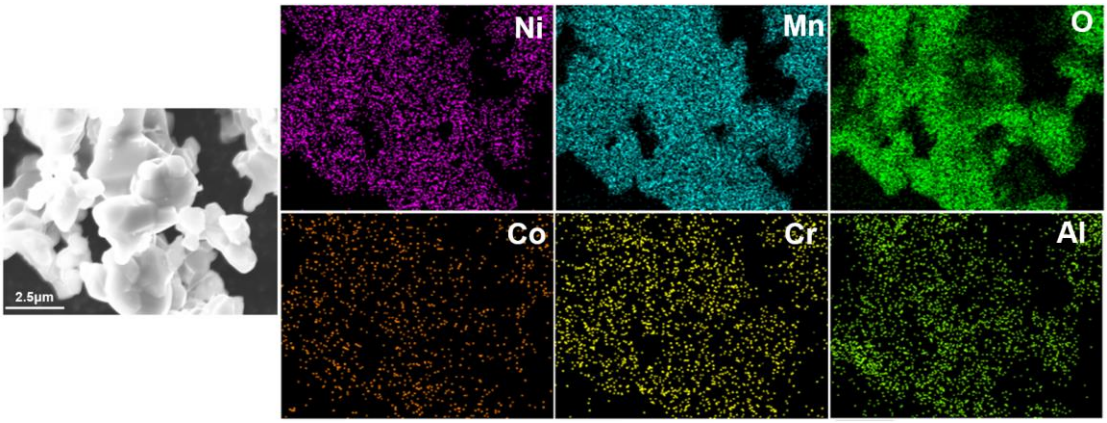

Figure S5. SEM image and EDS analysis of the multi-component precursor $Ni_{0.475}Co_{0.025}Cr_{0.025}Al_{0.025}Mn_{1.45}O_{4-x}$.

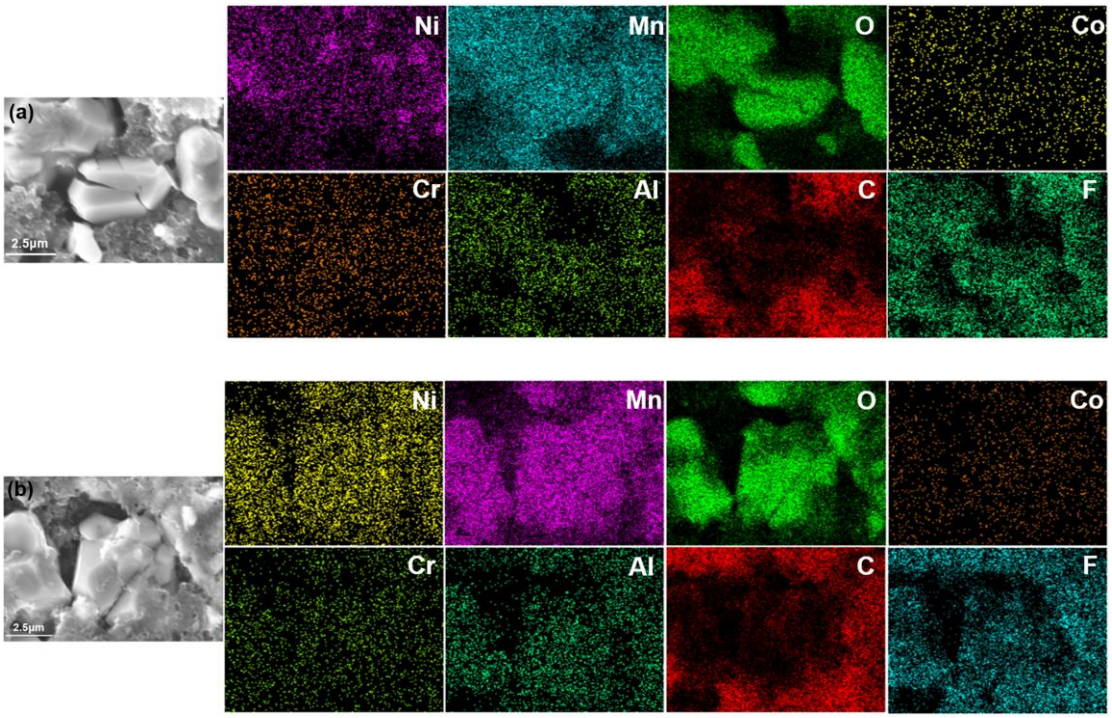

Figure S6. EDS analysis of (a) LNMO and (b) T-LNMO electrodes after 200 cycles at 1 C.

Table S1. The atomic ratio by XPS analysis results of both samples.

	PP At. (%) of each element							
Samples	**Li**	**Ni**	**Mn**	**Co**	**Cr**	**Al**	**O**	**C**
LNMO	41.54	4.39	12.54	0.33	0.14	2.02	33.86	5.18
T-LNMO	41.84	4.41	12.71	0.36	0.17	2.05	32.64	5.82