

Investigation on the Origin of Anionic Redox Sluggish Kinetics in Cation-Disordered Cathode

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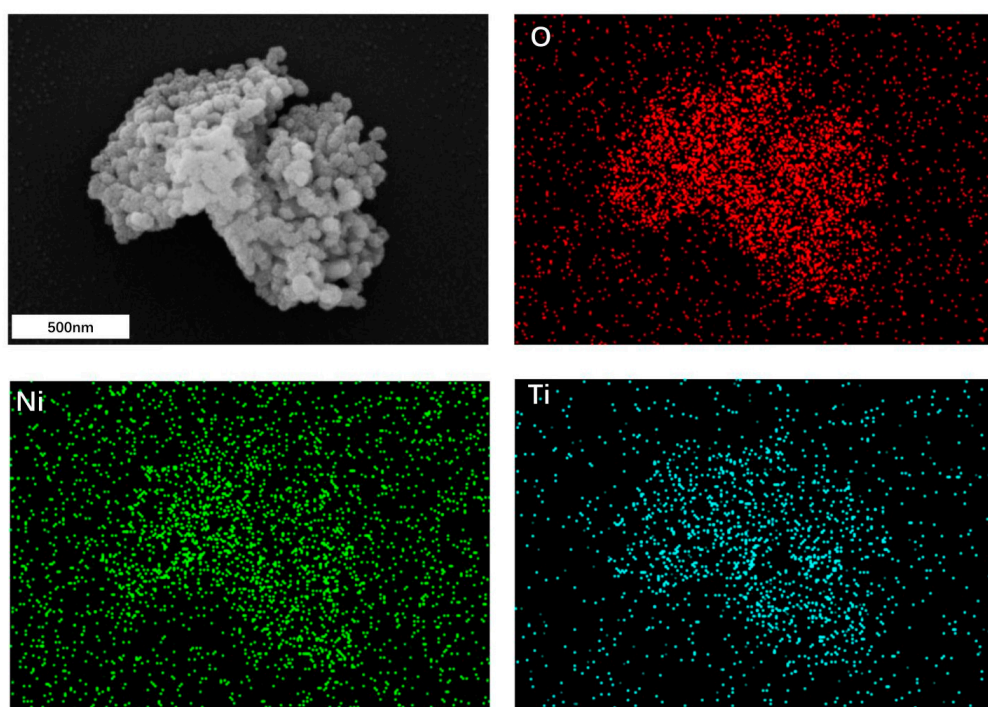


Figure S1. The Energy Dispersive X-Ray Spectroscopy (EDX) element diagram of LTNO cathode. The result shows the uniform distribution of Ti, Ni and O element signal in the prepared material.

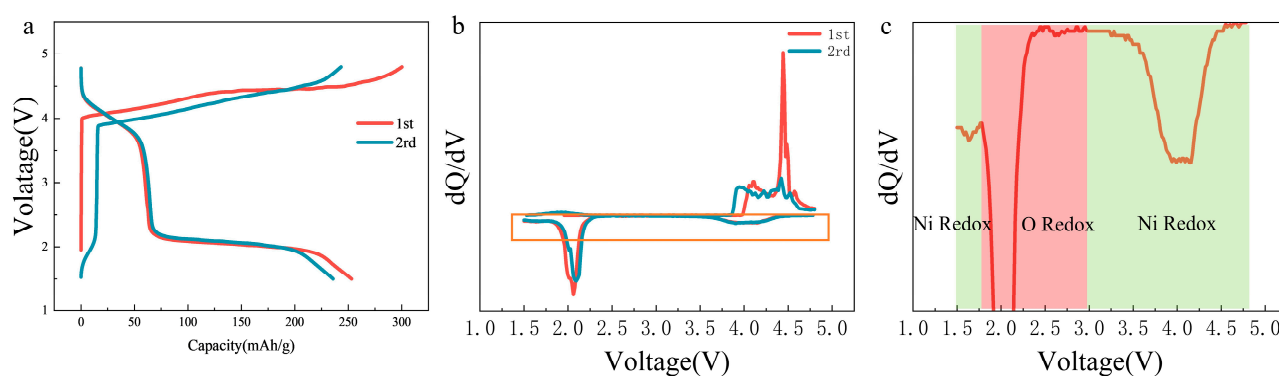


Figure S2. Electrochemical properties of $\text{Li}_{1.17}\text{Ti}_{0.58}\text{Ni}_{0.25}\text{O}_2$. (a) charge-discharge curves and (b) dQ/dV curves, the details of the orange area are shown in (c), the peaks at 4.0 V and 1.75 V are attributed to the redox of Ni (green shadow), and the peak at 2.0 V is attributed to the redox of O (red shadow)[1].

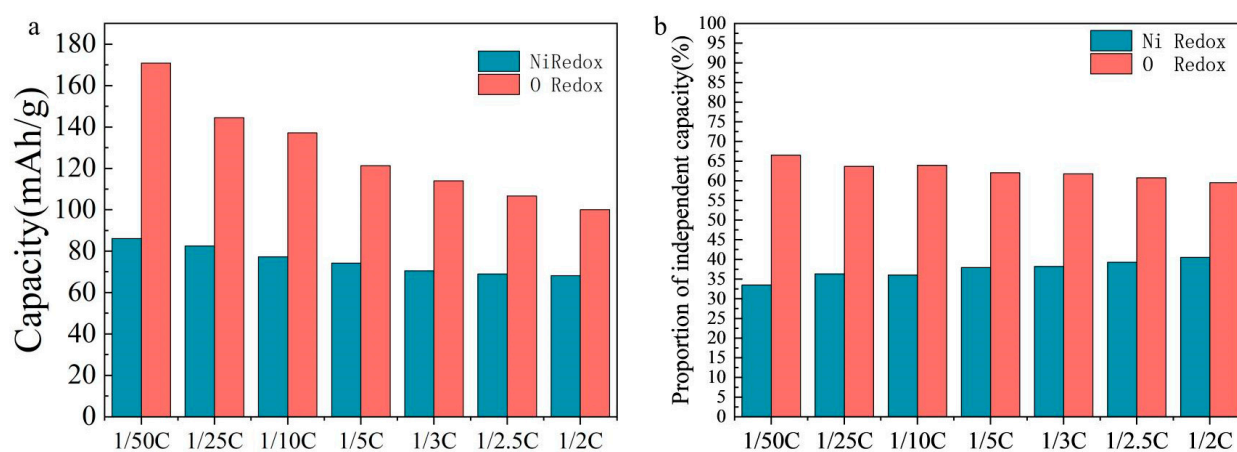


Figure S3. (a) The capacity of O and Ni at different rates and (b) their proportion in the total capacity. As the rate increases, the capacity released by O reduction (O Redox) decays more rapidly than the capacity released by Ni reduction (Ni Redox). At the same time, the proportion of O Redox in the total capacity gradually decreases, and the proportion of Ni Redox gradually increases.

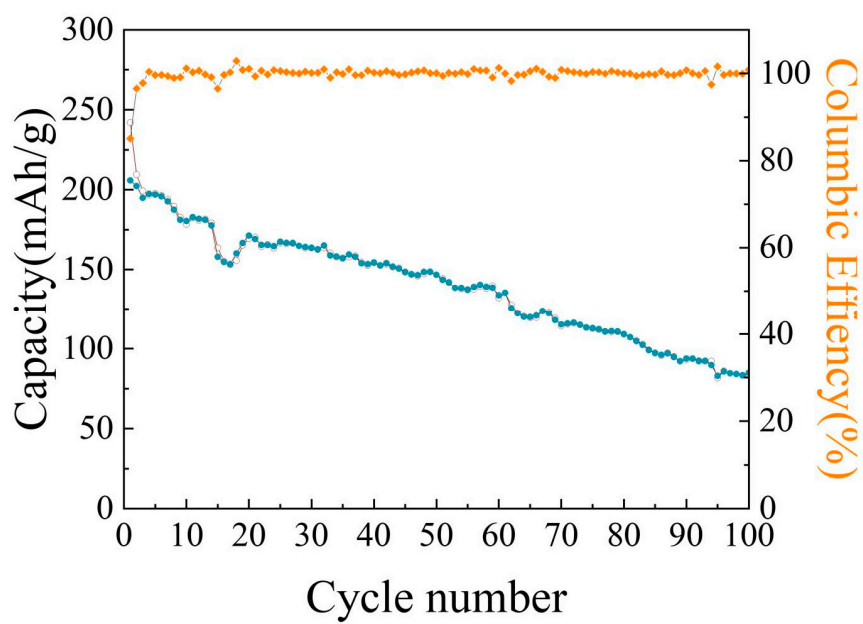


Figure S4. The cyclic performance of $\text{Li}_{1.17}\text{Ti}_{0.58}\text{Ni}_{0.25}\text{O}_2$ at 0.5 C.

[1] J.M. Tarascon, Capturing dynamic ligand-to-metal charge transfer with a long-lived cationic intermediate for anionic redox, *Nat Mater*, 21 (2022) 1165-1174.