

Electronic Supplementary Information

$\text{Ru}_{0.01}\text{Ti}_{0.99}\text{Nb}_2\text{O}_7$ as an intercalation-type anode material with a large capacity and high rate performance for lithium-ion batteries

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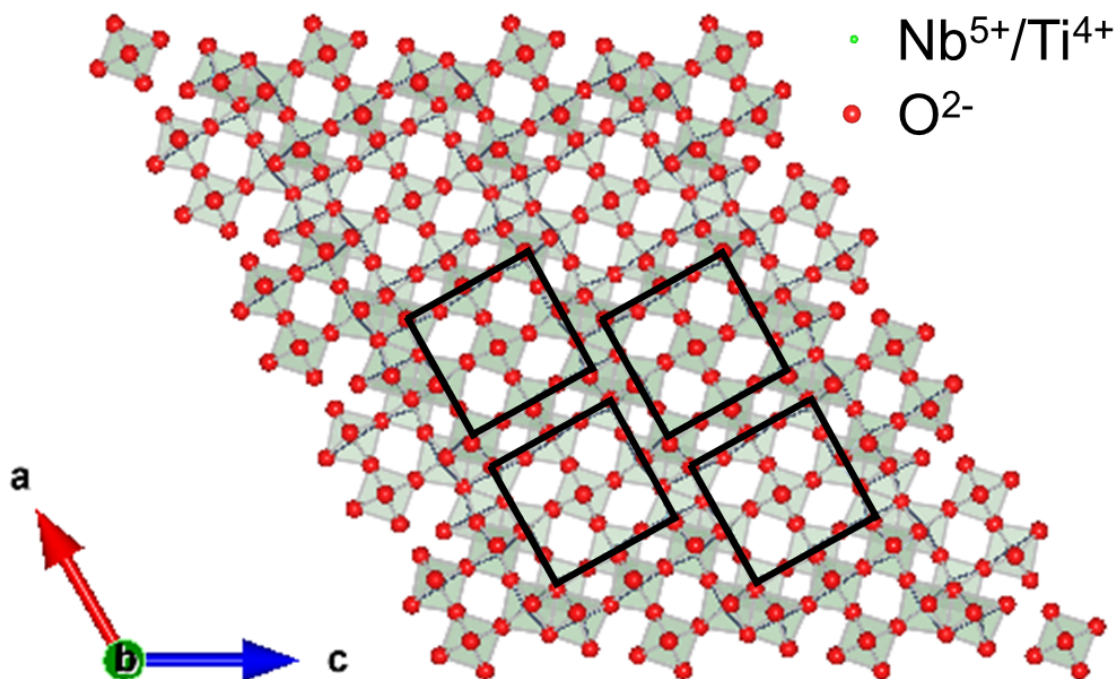


Fig. S1 Crystal structure of TiNb_2O_7 showing the $m \times n \times \infty$ ($m = n = 3$) ReO_3 -type blocks.

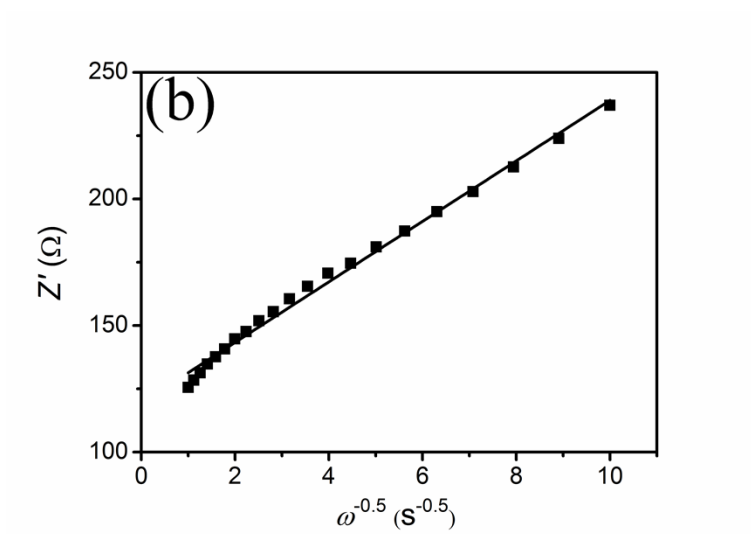
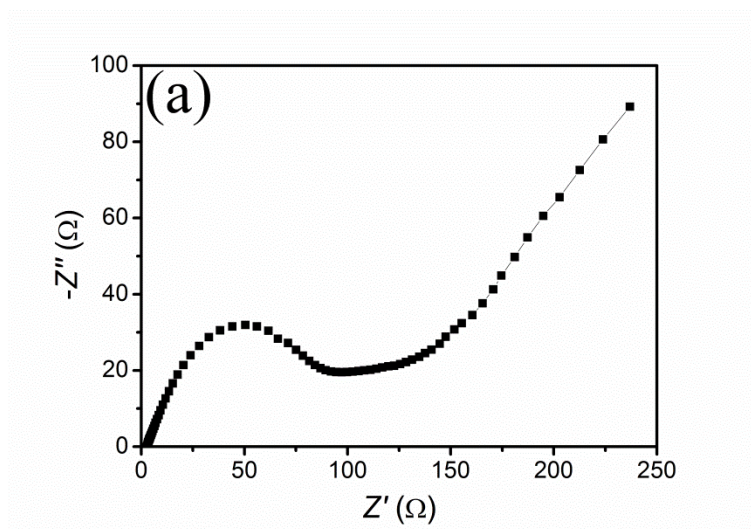


Fig. S2 (a) Nyquist plots of $\text{Li}_4\text{Ti}_5\text{O}_{12}/\text{Li}$ cell. (b) Relationship between real impedance with low frequency for $\text{Li}_4\text{Ti}_5\text{O}_{12}/\text{Li}$ cell. The specific surface area of $\text{Li}_4\text{Ti}_5\text{O}_{12}$ is $3.63 \text{ m}^2 \text{ g}^{-1}$. The loading density of $\text{Li}_4\text{Ti}_5\text{O}_{12}$ is 1.45 mg cm^{-2} . $\sigma_w = 11.95 \text{ } \Omega \text{ s}^{-0.5}$. $D = 1.81 \times 10^{-16} \text{ cm}^2 \text{ s}^{-1}$.

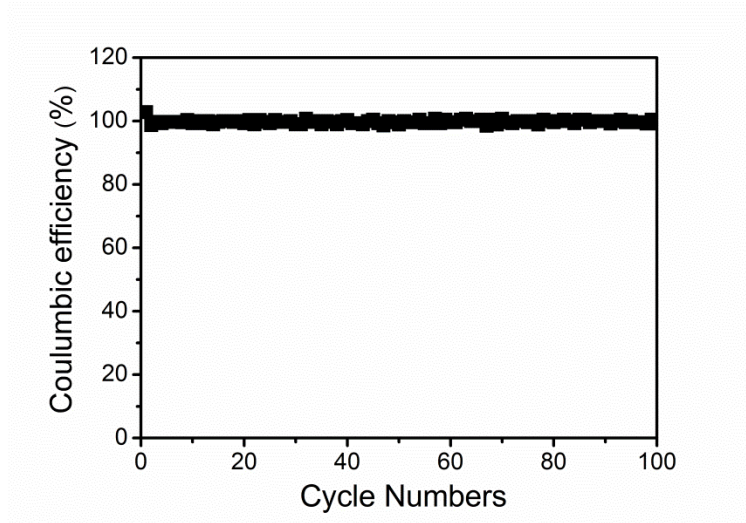


Fig. S3 Coulombic efficiency of $\text{Ru}_{0.01}\text{Ti}_{0.99}\text{Nb}_2\text{O}_7/\text{Li}$ cell at 5 C.

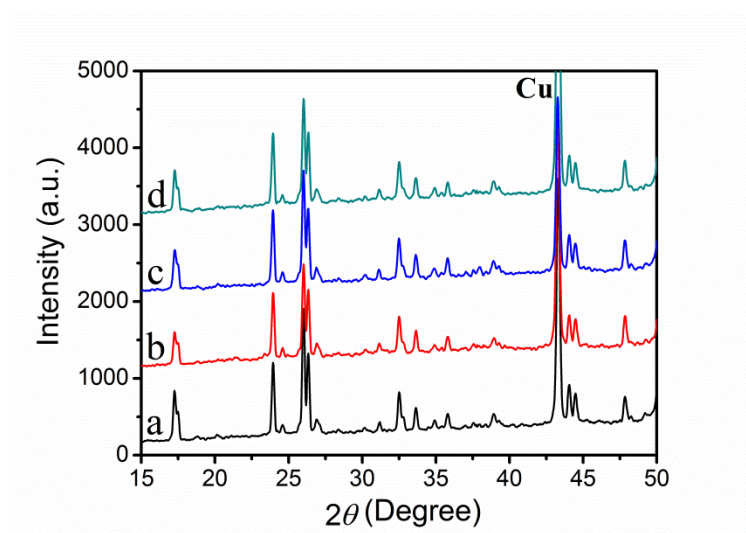


Fig. S4 *Ex-situ* XRD patterns of TiNb_2O_7 electrodes after (a) as-fabricated, (b) first-discharged to 0.8 V vs. Li/Li^+ , (c) first-charged to 3 V vs. Li/Li^+ , and (d) charged to 3 V vs. Li/Li^+ in the 10th cycle. Identical discharge–charge rates were used.

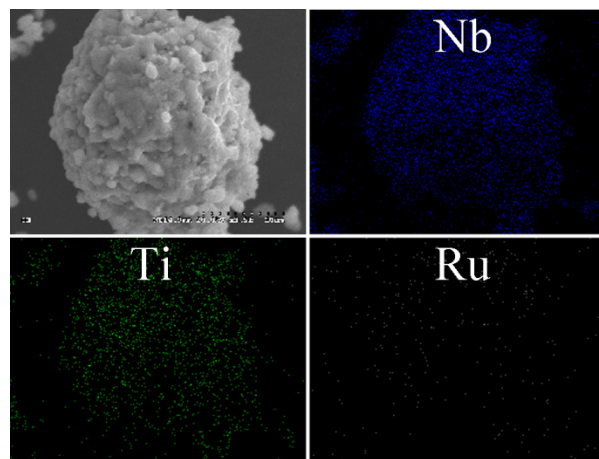


Fig. S5 SEM image and EDX mapping of $\text{Ru}_{0.01}\text{Ti}_{0.99}\text{Nb}_2\text{O}_7$.