

A Novel Strategy Via Electrode Catalysis Induced Nano Transformation for Lithiated-Bimetallic- Oxides to Avoid Long Activation Process of Advanced Lithium-Ion Batteries

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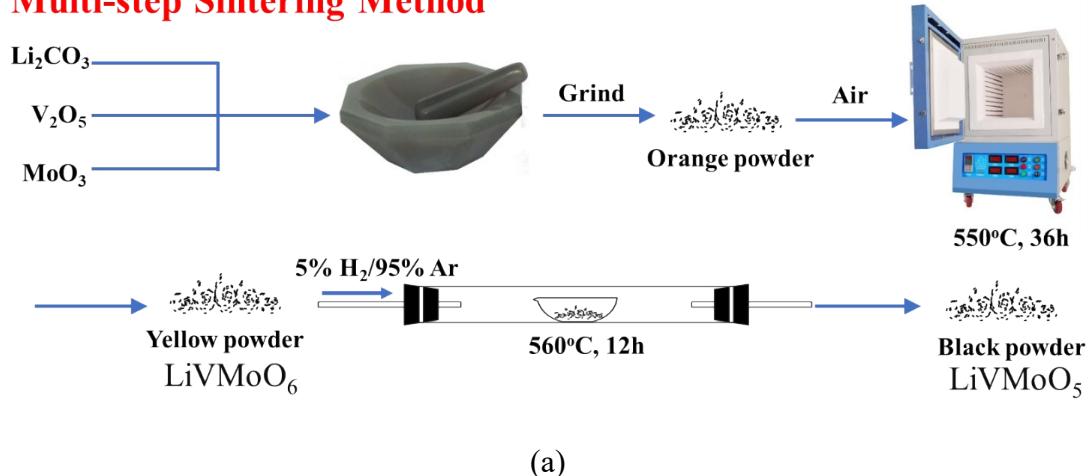
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Table S1. The relevant fitting results of the Nyquist plots of the LVME and STLVMME before cycle, after 50 cycles at a current density of 100 mA g⁻¹.

Cells	$R_{cf} (\Omega)$	$R_s (\Omega)$	$R_{ct} (\Omega)$	$\sigma_W (\text{Hz}^{1/2} \cdot \Omega)$
LVME				
Before cycle	-	2.74	501.4	278.4
After 50 cycles	13.79	1.40	12.05	54.3
STLVME				
Before cycle	-	1.81	222.4	83.1
After 50 cycles	29.30	5.15	39.73	36.7

Multi-step Sintering Method



One-step sintering Method

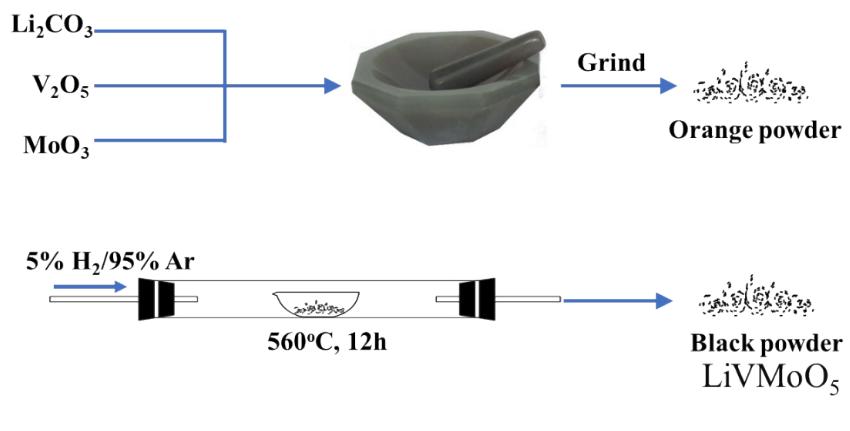


Fig. S1. (a) Simple scheme of LiVMoO₅ power prepared by multi-step sintering method; (b)

Simple scheme of LiVMoO₅ power prepared by one-step sintering method.

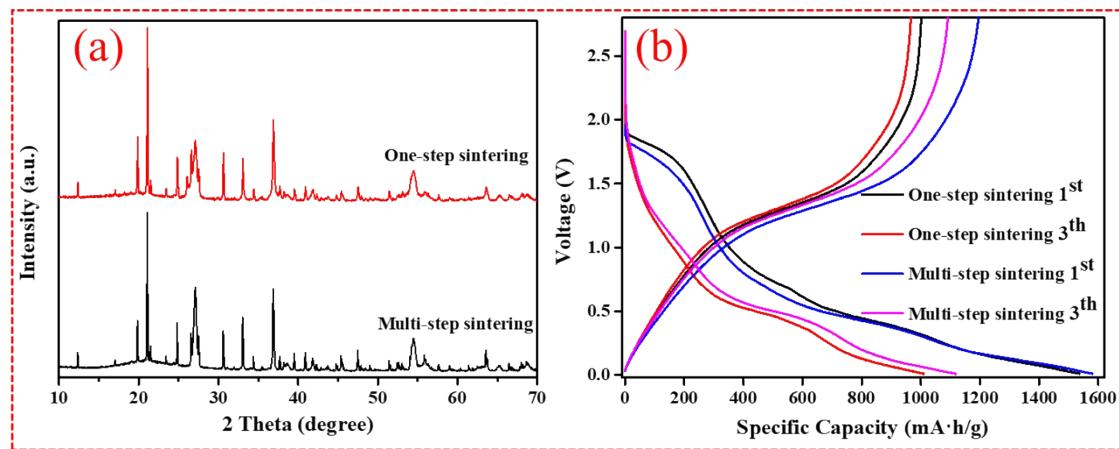


Fig. S2. (a) X-ray diffraction pattern of LiVMoO₅ sample prepared by multi-step sintering method and one-step sintering method; (b) The charge/discharge profiles of the initial 1st, 3rd cycles at a current density of 100 mA g⁻¹ for the STLVME prepared by multi-step sintering method and one-step sintering method.

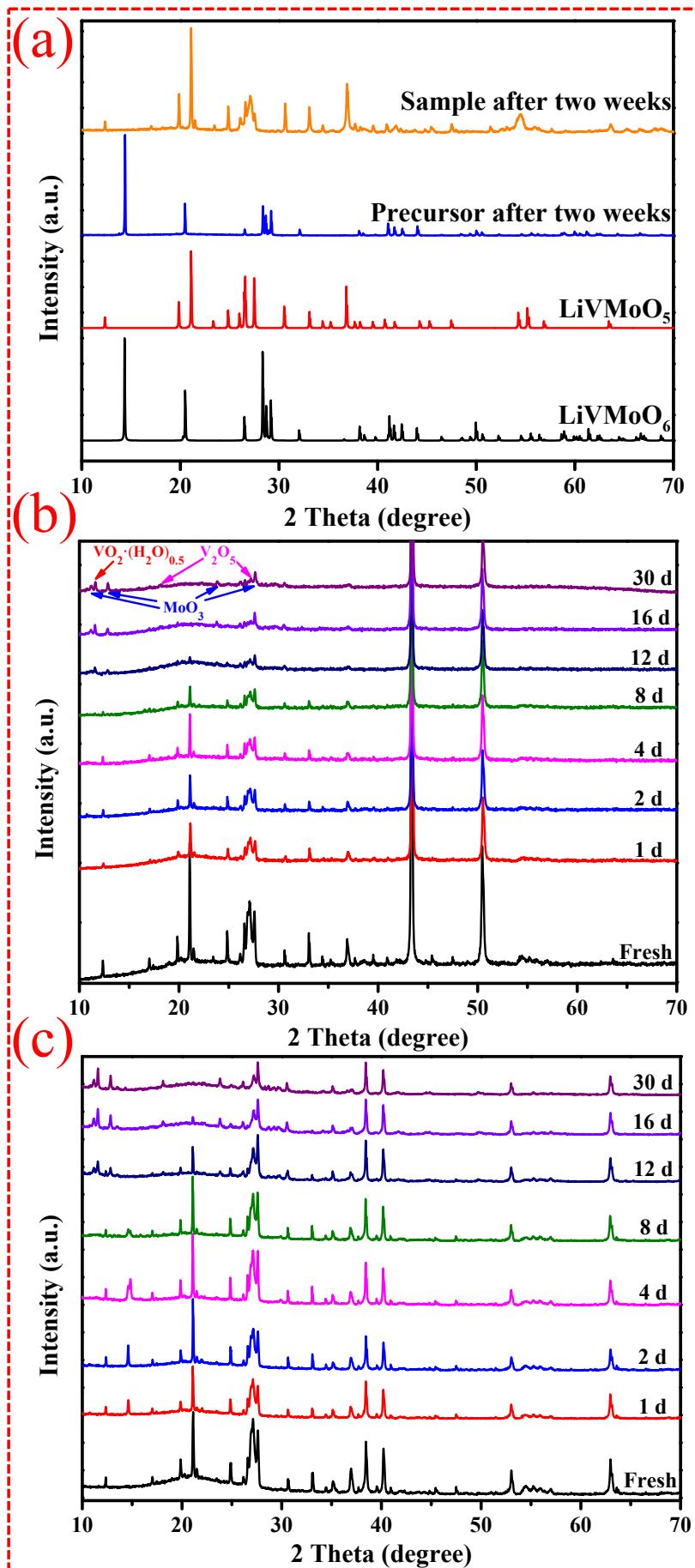


Fig. S3. (a) The X-ray diffraction pattern of the LiVMoO_5 power after two weeks in air and the precursor power after two weeks in air; (b) The *ex-situ* XRD pattern evolution of the LiVMoO_5 electrode (Cu Collector) for one month in the air; (c) The *ex-situ* XRD pattern evolution of the LiVMoO_5 electrode (Ti Collector) for one month in air.

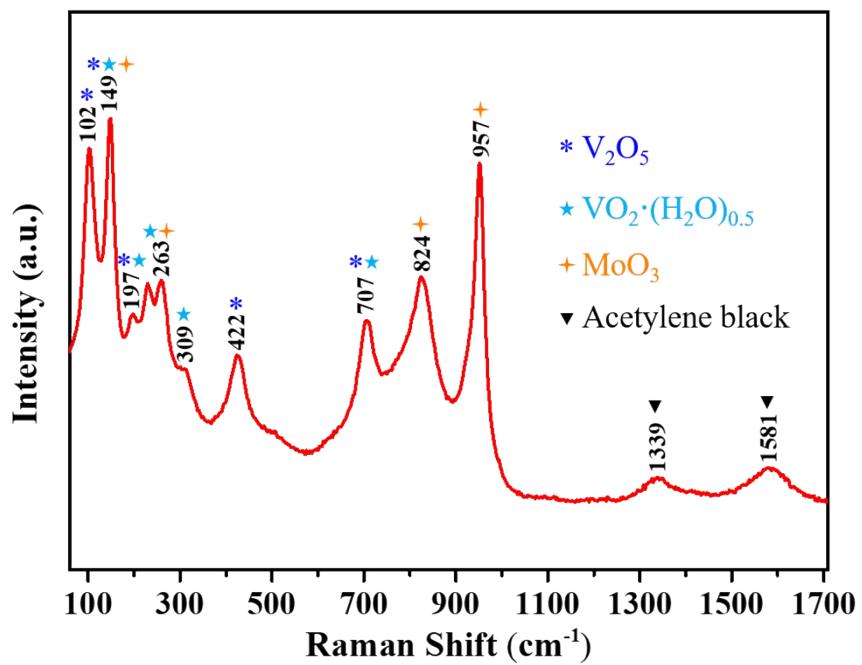


Fig. S4. The Raman spectrum of the STLVM.

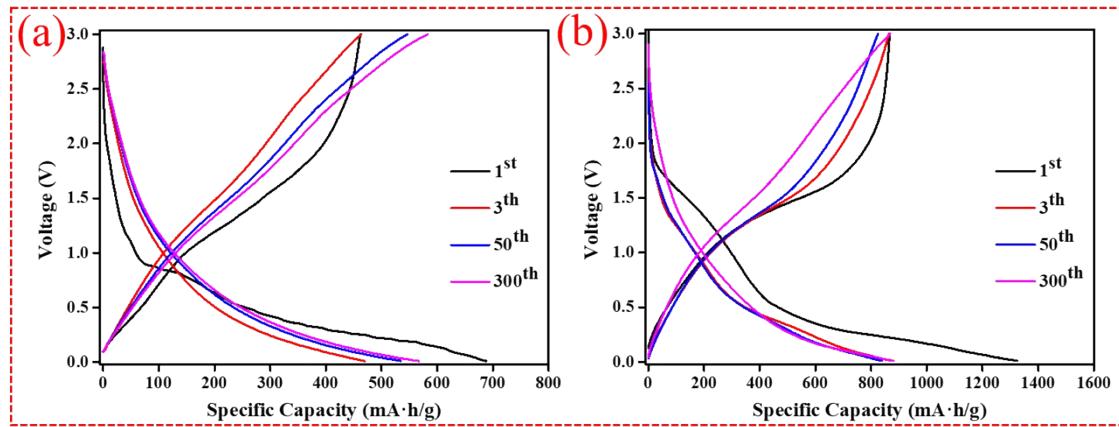


Fig. S5. (a, b) The charge/discharge profiles of LVME and STLVME for different cycles at a current density of 0.5 A g^{-1} .

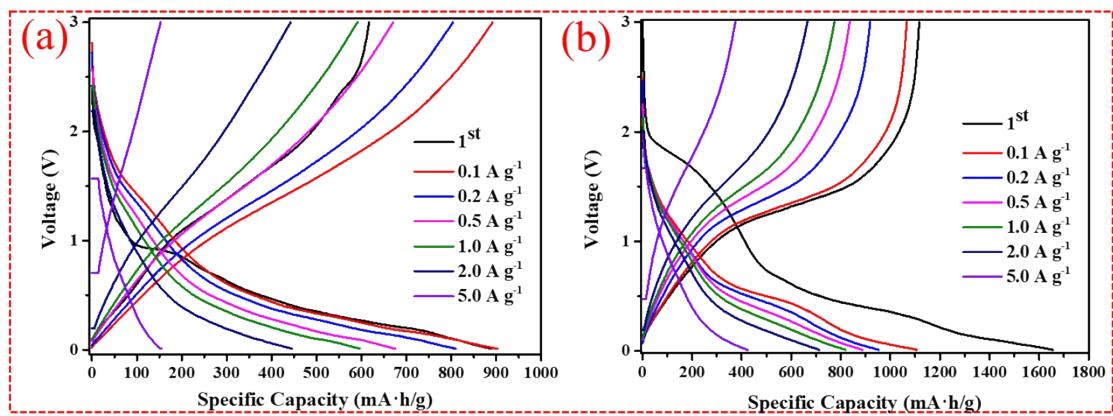


Fig. S6. (a, b) The charge/discharge profiles of LVME (after 50 cycles at a current density of 100 mA g⁻¹) and STLVME at various current rates (0.1, 0.2, 0.5, 1.0, 2.0 and 5.0 A g⁻¹).

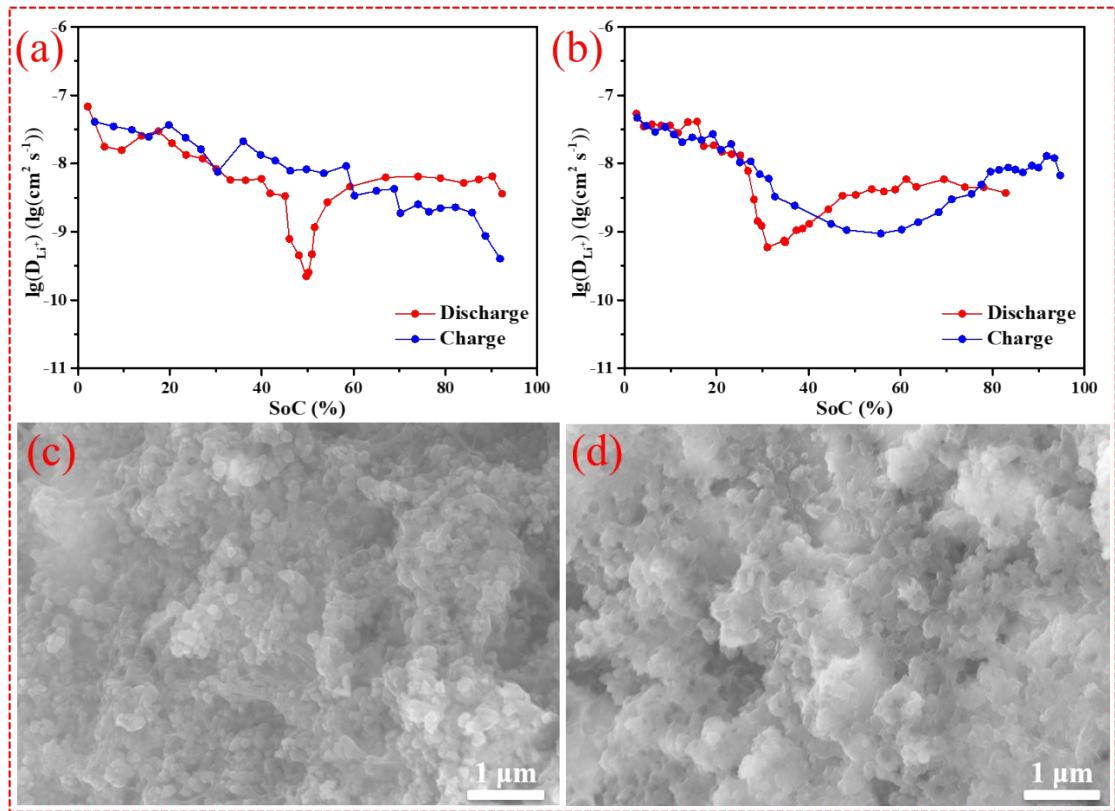


Fig. S7. (a, b) The $\lg(D_{Li^+})$ ($\lg(Li^+$ diffusion coefficient)) versus the state of charge (SoC) of the LVME and STLVME during charge/discharge process in LIBs; SEM images of (c) STLVME (LVME specially treated after two weeks), (d) LVME after 50 cycles at a current density of 100 mA g^{-1} .

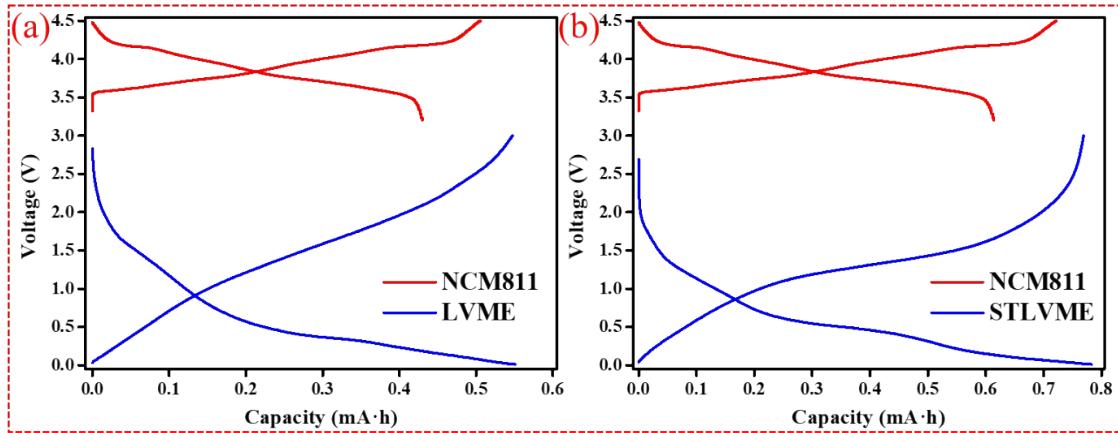


Fig. S8. The 3rd charge/discharge curves of NCM811 and (a) LVME; (b) STLVME in the Li-ion half-cells at 0.1 C rate ($1\text{ C} = 200\text{ mA g}^{-1}$) (ratio of capacity is maintained as anode: cathode = 1.1:1).