

## Supporting Information

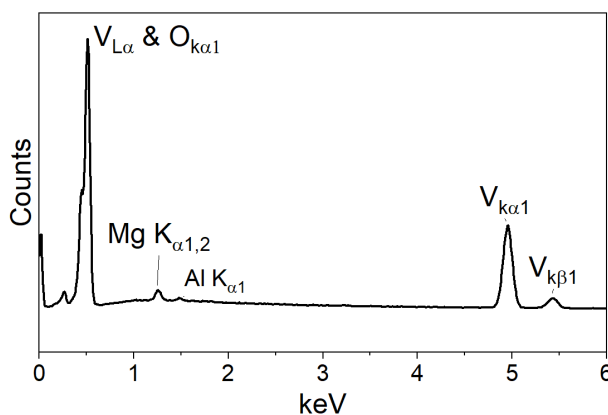
# Enhanced Cycling Performance of Bilayered Vanadium Oxide Cathode in Li-Ion Batteries via Dual Metal-Ion Preintercalation

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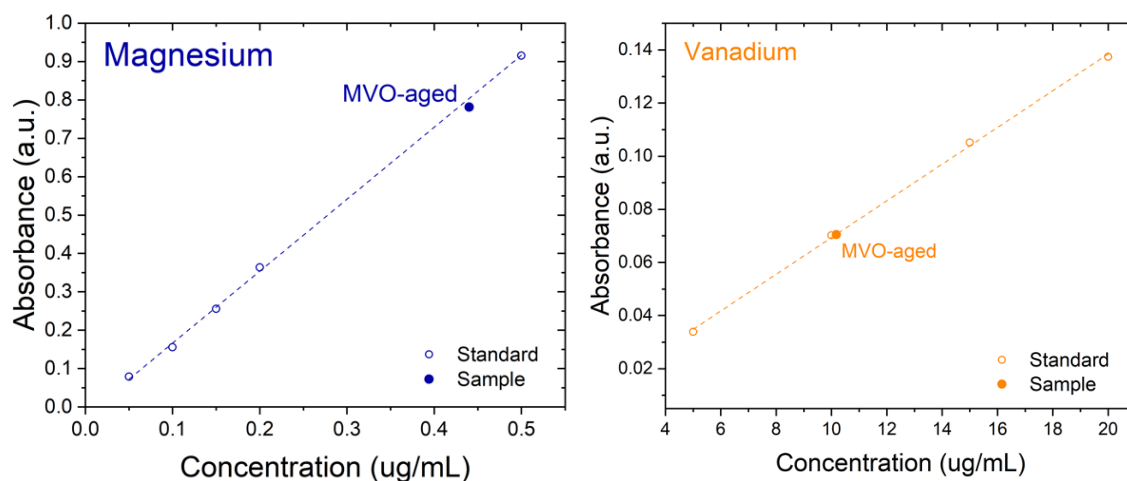
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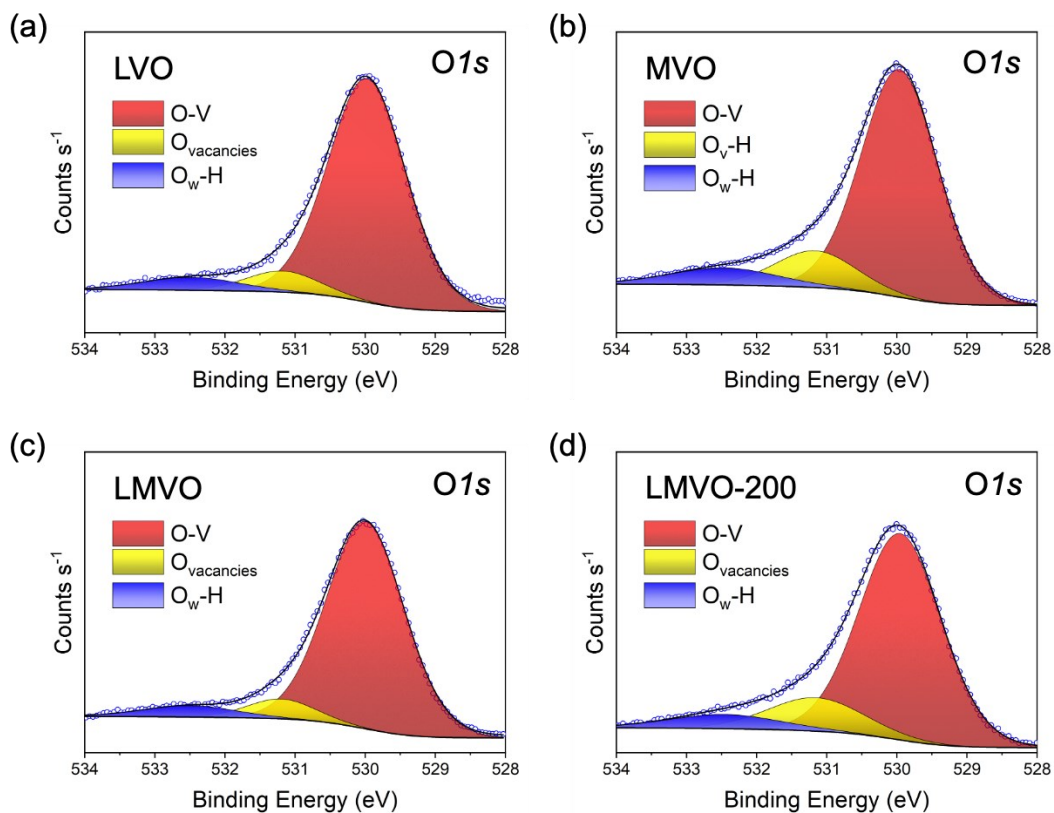
**Keywords:** layered oxides; chemical preintercalation; annealing; cathodes; lithium-ion batteries.



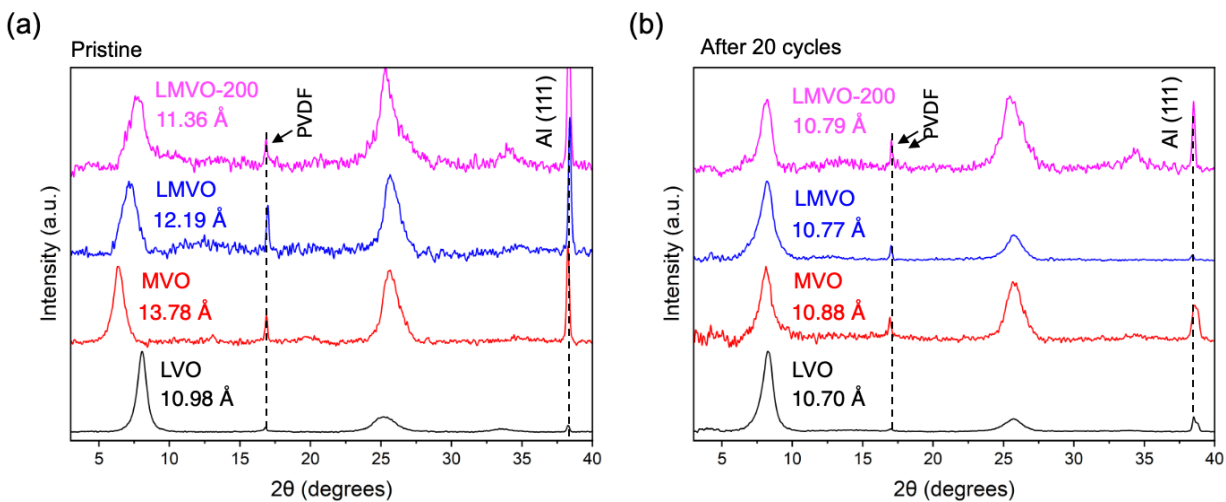
**Figure S1.** EDS spectra of LMVO showing the signal from vanadium, oxygen, and magnesium.



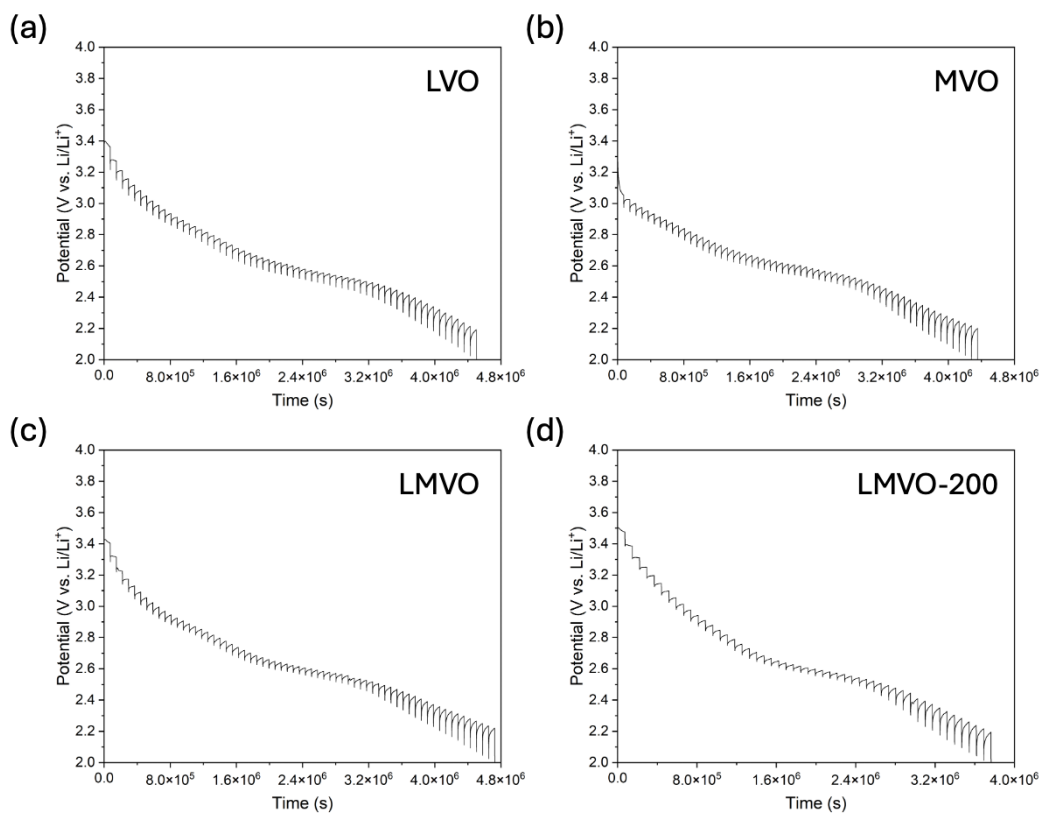
**Figure S2.** AAS calibration curve and absorbance values of Mg and V for MVO-aged precursor before hydrothermal treatment.



**Figure S3.** O1s region of XPS spectra of LVO, MVO, LMVO, and LMVO-200 demonstrating the signals from lattice oxygen, oxygen vacancies, and structural H<sub>2</sub>O.



**Figure S4.** Ex-situ XRD analysis of (a) pristine electrodes (b) electrodes after being galvanostatically cycled in lithium-ion cells for 20 cycles at 20 mA g<sup>-1</sup>.



**Figure S5.** GITT profiles of (a) LVO, (b) MVO, (c) LMVO, and (d) LMVO-200 electrodes that were used to develop the diffusion coefficients of Li<sup>+</sup> ions.