Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A

Polymer Coating of Vanadium Oxide Nanowires to Improve Cathodic Capacity in Lithium Batteries
Supplemental Information

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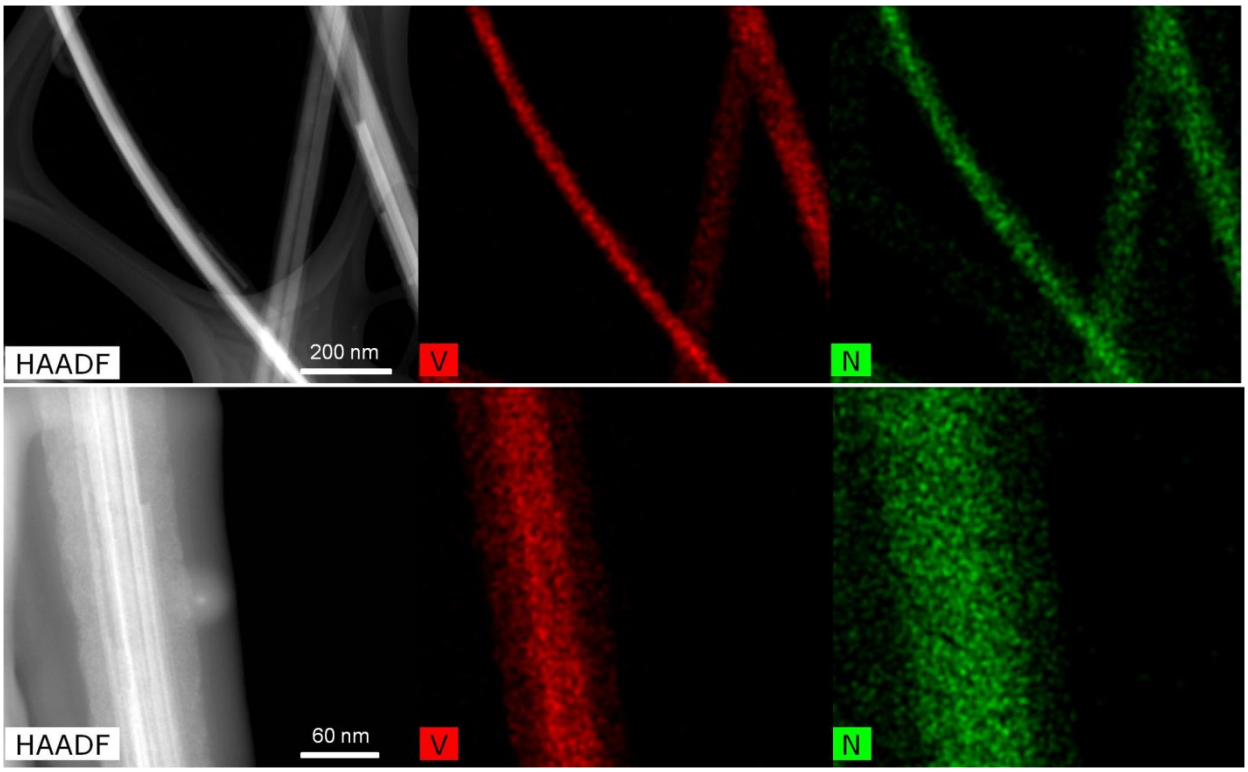
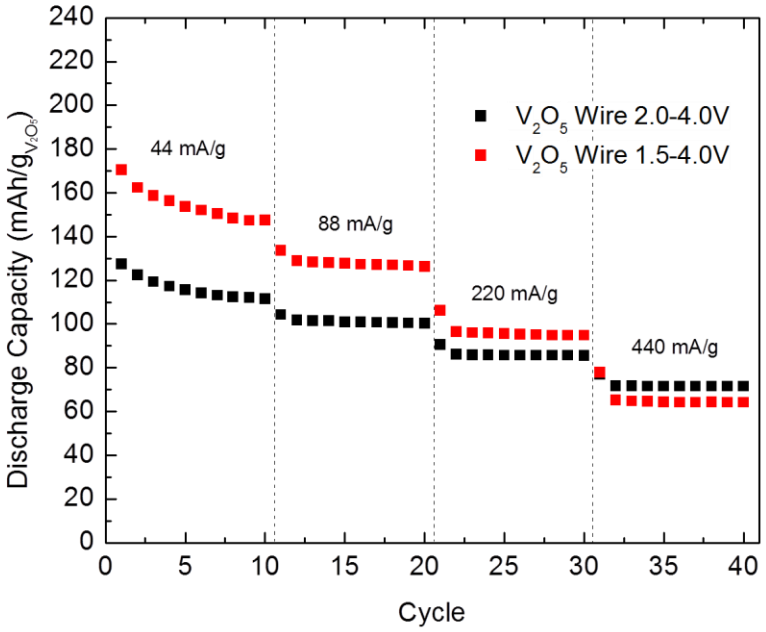
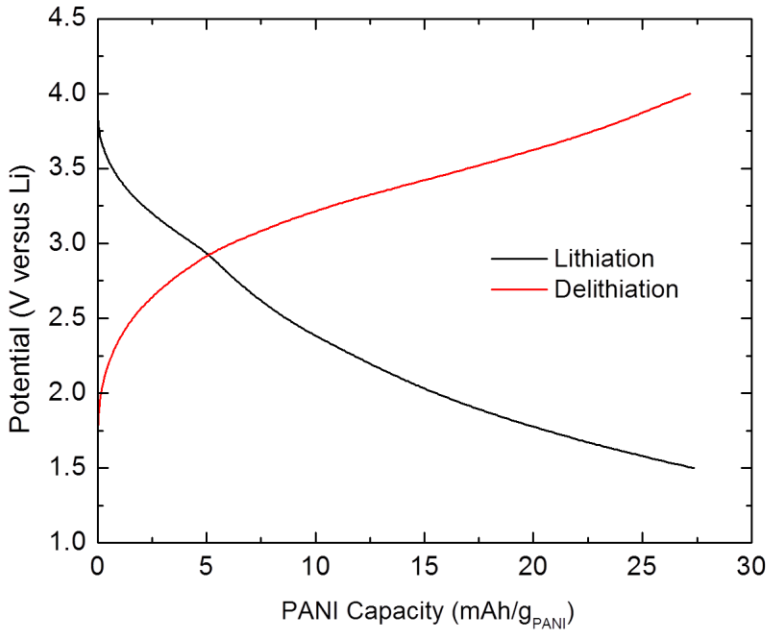


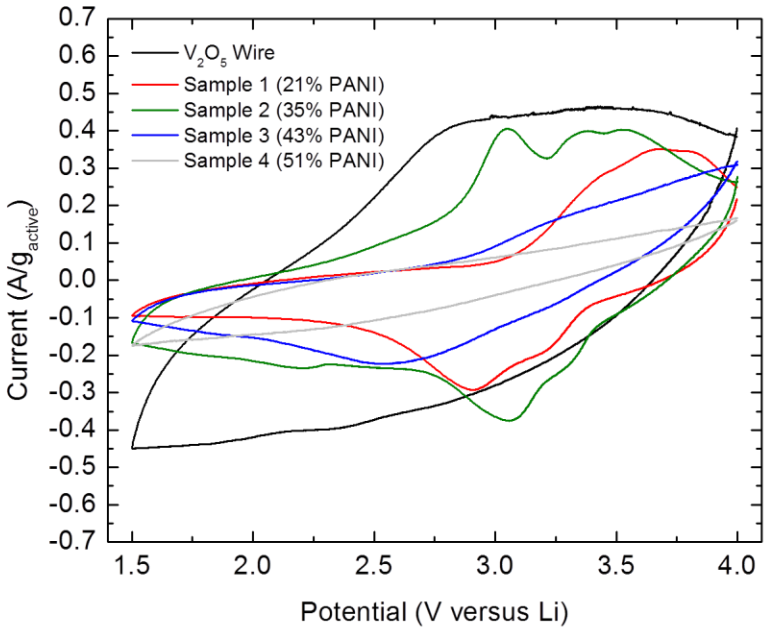
S1. STEM elemental mapping of V_2O_5-PANI Sample 2 (top) and Sample 4 (bottom) nanowire composites with vanadium (red) and nitrogen (green), used as an indicator of PANI.



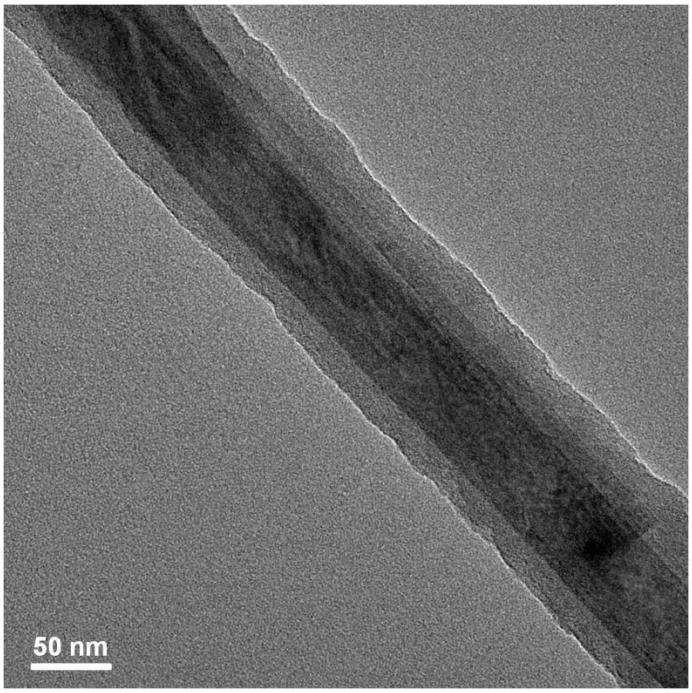
S2. Galvanostatic cycling results for V_2O_5 wire electrodes, 40 cycles at increasing rates (44, 88, 220, 440 mA/g) between 1.5-4.0V and 2.0-4.0V.



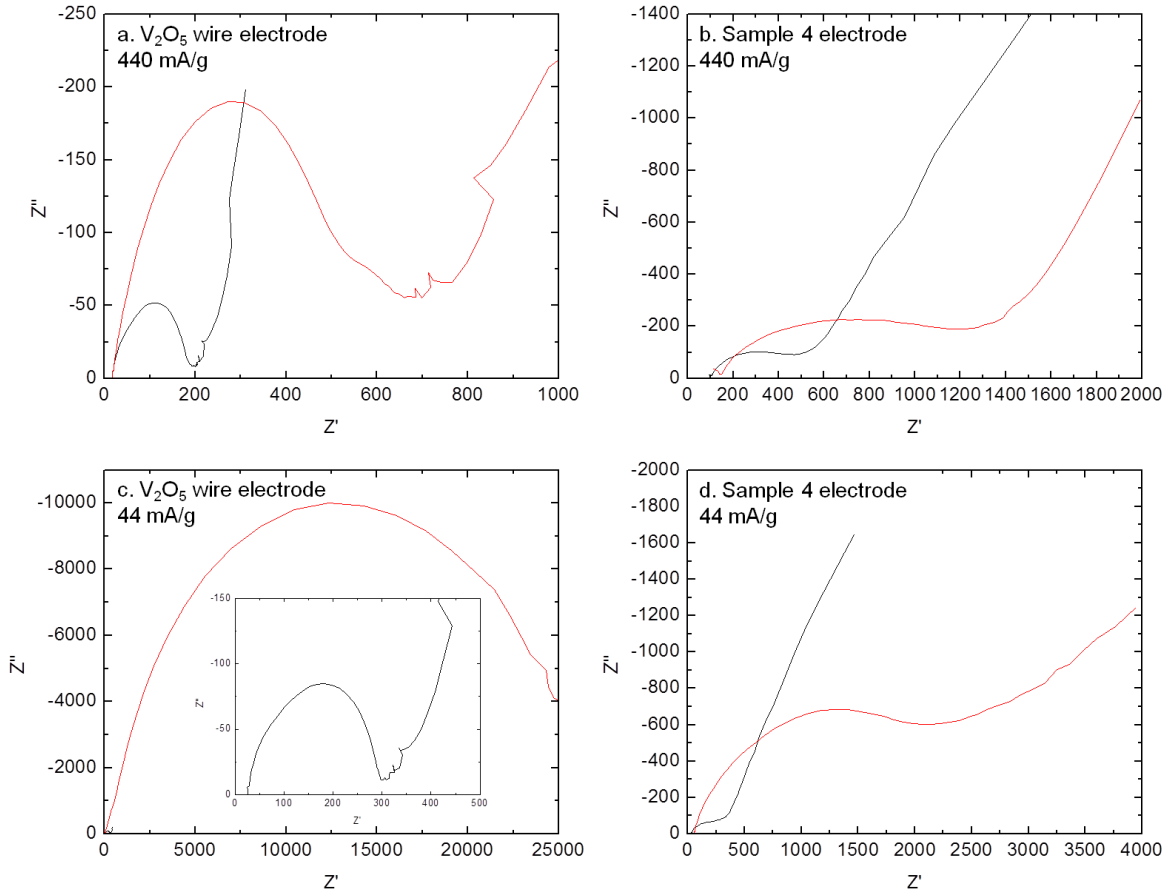
S3. First cycle capacity profile of 30% by weight PANI deposited on carbon black. Discharge capacity is ~27 mAh/g$_{PANI}$, which agrees with previous literature.



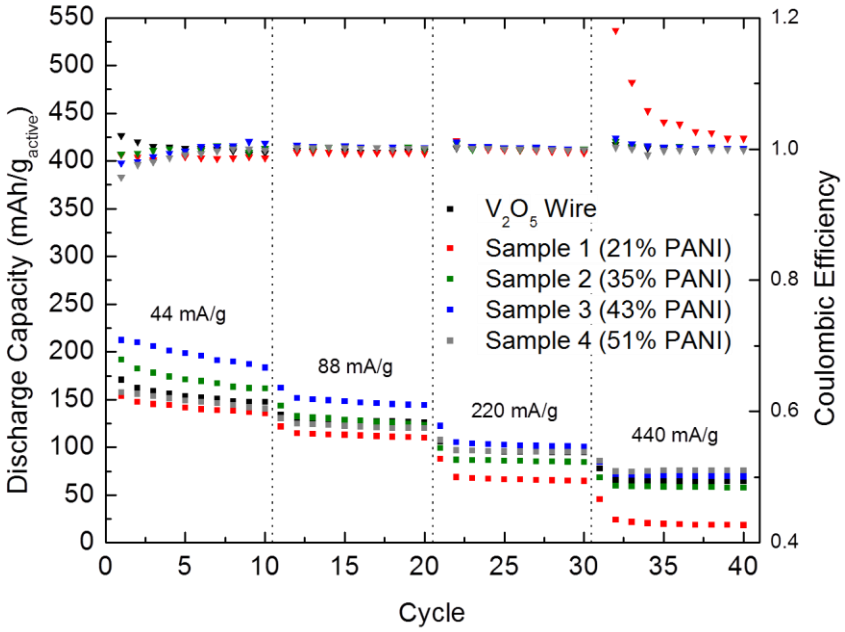
S4. Cyclic voltammograms of V_2O_5-PANI samples and V_2O_5 wire control at a scan rate of 1 mV/s.



S5. TEM image of V_2O_5-PANI Sample 4 after 100 cycles at 440 mA/g. This confirms the stability of the polyaniline layer for most of the electrode, although the SEM in Figure 4d suggests that the electrode surface may be less stable.



S6. Impedance measurements before (black) and after (red) long term cycling of V_2O_5 wire and Sample 4 electrodes at (a,b) 440 mA/g for 100 cycles or (c,d) 44 mA/g for 50 cycles.



S7. Half-cell capacity of active material over under several charge rates, unnormalized from Figure 5.

V_2O_5-PANI Sample	**APS:An Molar Ratio**	**Weight % PANI**
1	0.2	21
2	0.5	35
3	0.7	43
4	1.0	51

Supplementary Table 1. V_2O_5-PANI samples with varying weight percentages of PANI.