Supporting Information

# Facile synthesis of hierarchical networks composed of highly interconnected $V_2O_5$ nanosheets assembled on carbon nanotubes and their superior lithium storage properties

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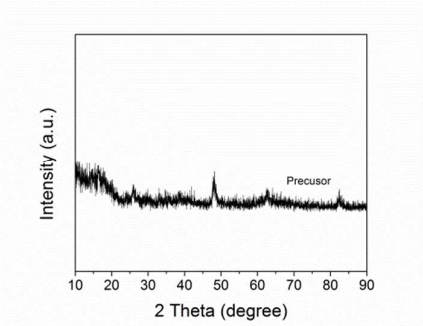


**Figure S1.** XRD pattern of the precusor of CNT@$V_2O_5$. The precusor is crystalline, might be a V-based compound.

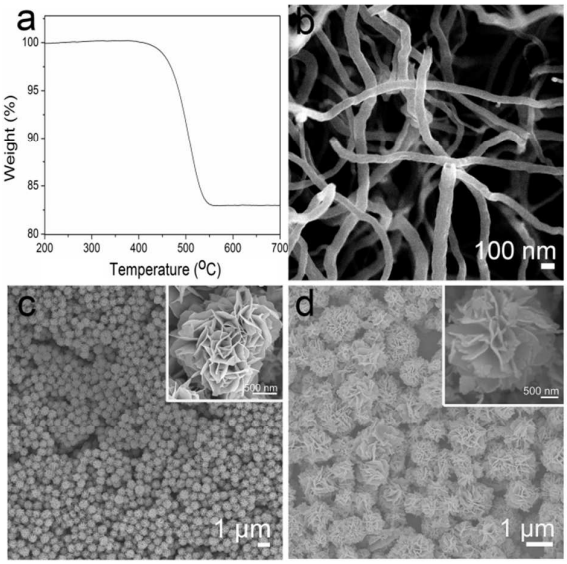


**Figure S2.** (a) Thermogravimetric analysis (TGA) curve of the CNTs@$V_2O_5$ sample. (b) SEM image of CNTs. (c) SEM image of the precursor of $V_2O_5$-mf，with inset showing a single flower at higher magnification. (d) SEM image of $V_2O_5$-mf, with inset showing single flower of $V_2O_5$-mf at higher magnification.

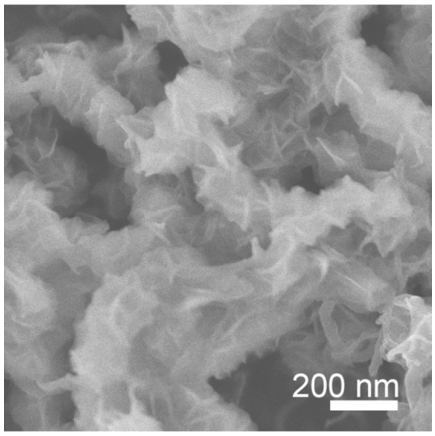


Figure S3. FESEM image of the precursor synthesized at 190 ºC for 10 hours.

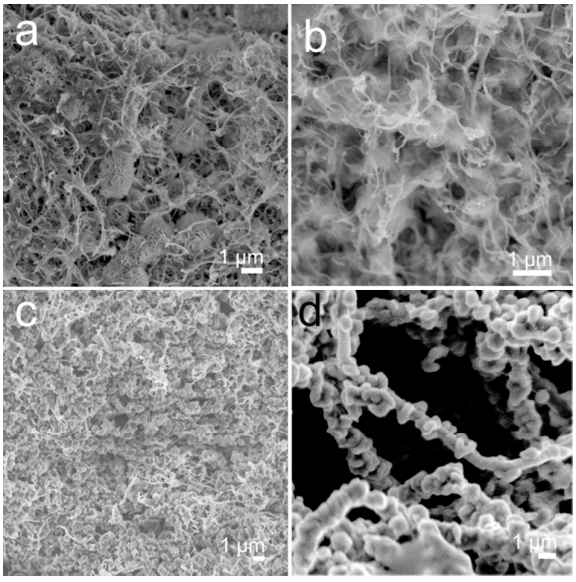


Figure S4. FESEM images of the precursors synthesized (a) without CTAB at 190 ºC for 15 hours, (b) without MP at 190 ºC for 15 hours, (c) replacing MP by diethylenetriamine at 190 ºC for 15 hours, and (d) replacing MP by dimethylformamide at 190 ºC for 15 hours.

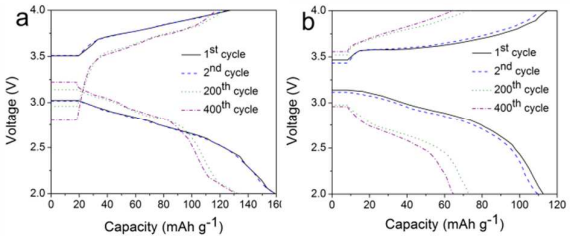


Figure S5. Charge-discharge voltage profiles of CNTs@$V_2O_5$ (a) and $V_2O_5$-mf (b) at the current rate of 20 C for the selected cycles indicated (for comparison, we kept the carbon content for all electrodes at the same ratio, i.e. the ratio of $V_2O_5$, carbon, and PVDF is 58:30:12 for all electrodes).

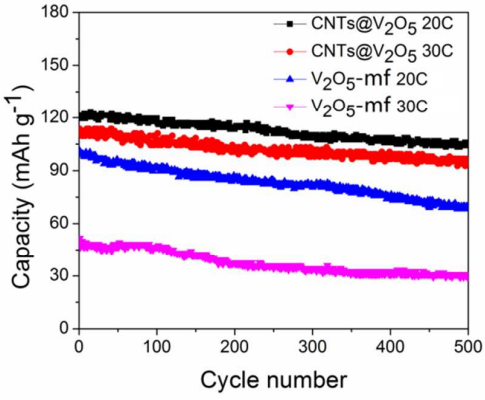


**Figure S6.** Cycling performances of CNTs@$V_2O_5$ and $V_2O_5$-mf in the voltage range of 2.5–4.0 V at the current rates of 20 C and 30 C.

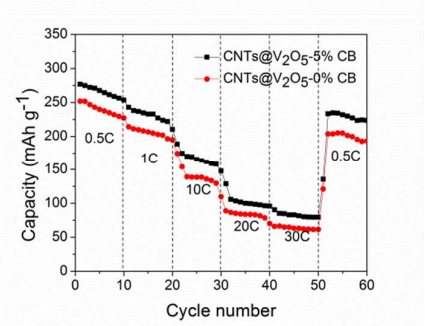


Figure S7. Rate capability of CNTs@$V_2O_5$ at various current rates (the ratio of active material, carbon black, and PVDF in the electrodes of CNTs@$V_2O_5$ are 85:5:10 and 90:0:10, respectively).

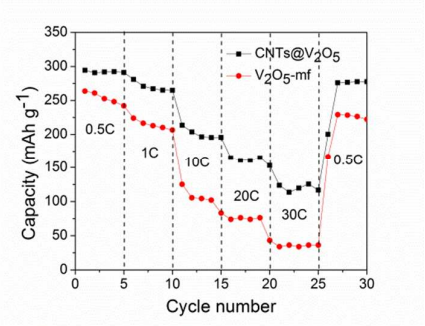


**Figure S8.** Rate capability of CNTs@$V_2O_5$ and $V_2O_5$-mf at various current rates (the weight ratio of active material, carbon black, and PVDF for CNTs@$V_2O_5$ and $V_2O_5$-mf are 70:20:10 and 58:30:12, respectively).

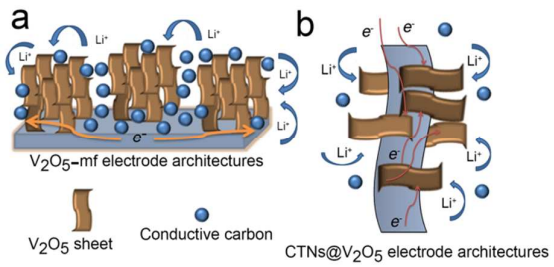


**Figure S9.** Schematic illustration of (a) conventional $V_2O_5$-mf electrode and (b) CNTs@$V_2O_5$ electrode with the enhanced charge transport.