Electronic Supplementary Material (ESI) for RSC Advances.

A Facile Strategy for the Synthesis of Graphene/V_2O_5 Nanoshperes and Graphene/VN Nanospheres Derived from a Single Graphene oxide-Wrapped VO_x Nanospheres Precursor for Hybrid Supercapacitors†

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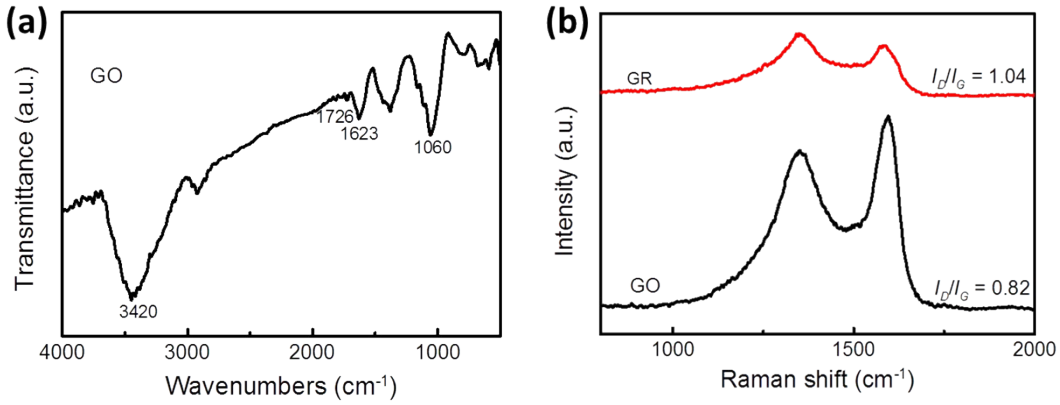

Fig. S1. (a) FTIR spectra of as-prepared GO; (b) the Raman spectra of as-prepared GO and GR.

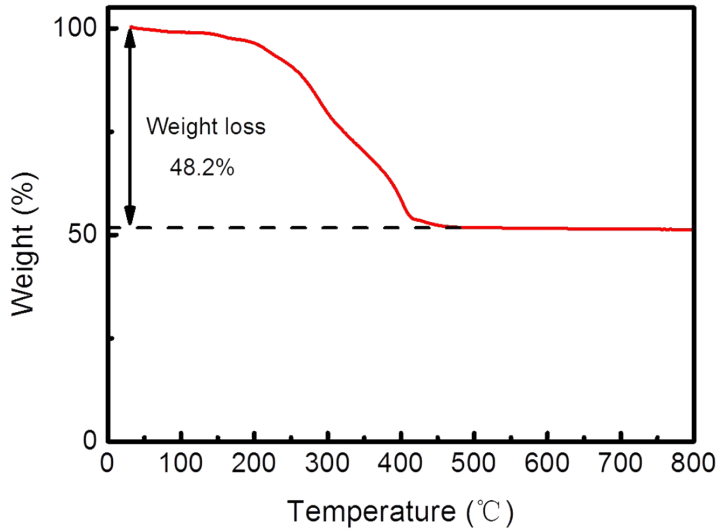

Fig. S2. TG of the GO-wrapped VO_x NSP precursor under an air atmosphere.

Thermogravimetric analysis (TG) were carried out on a SDT Q600 over the temperature range from 30 °C to 800 °C at a heating rate of 10 °C min-1 under air flow to explore the content of graphene in GO-wrapped VO_x NSP precursor. The final weight loss of 48.2 % is due to the oxidative decomposition of graphene in air. The final electrode was prepared by mixing the active material, conductive carbon black, and PVDF with a mass ratio of 90 : 5 : 5. Thus the content of graphene in the final electrode is 43.3 %.

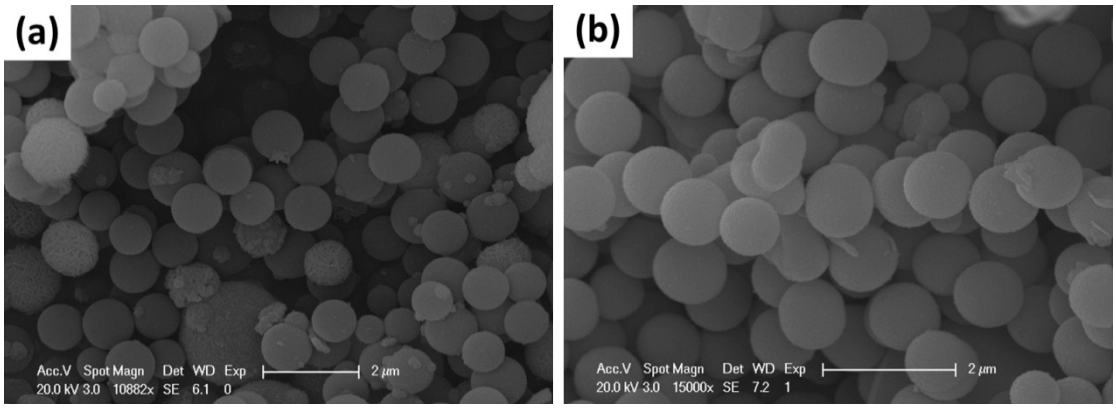

Fig. S3. (a) pure VN and (b) V_2O_5 nanospheres.

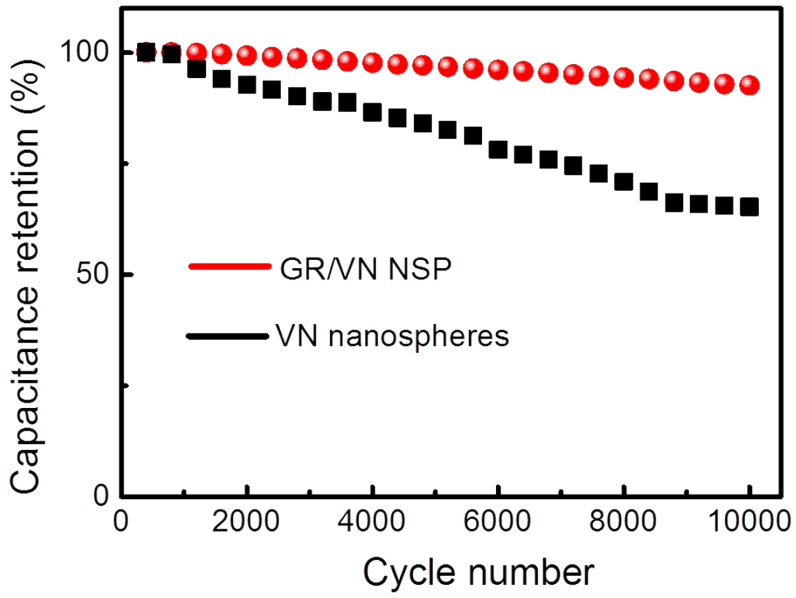

Fig. S4. Cycling performance of GR/VN NSP and pure VN nanospheres at current density of 10 A g^{-1}.

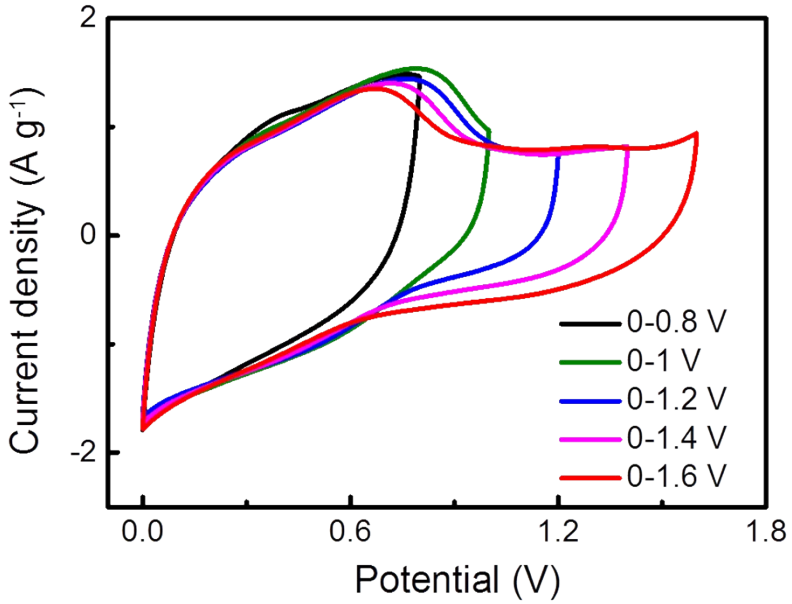

Fig. S5. CV curves measured at different operating voltages at a constant sweep rate of 15 mV s^{-1}.

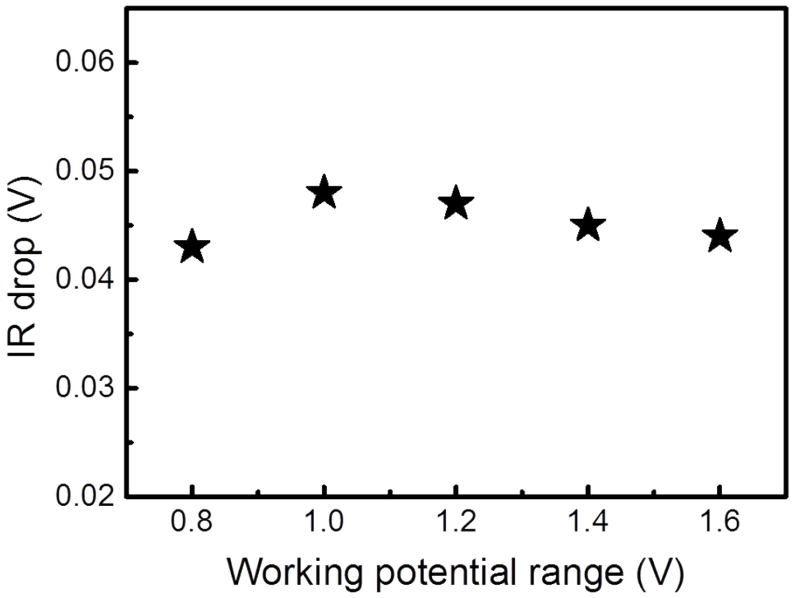

Fig. S6. The IR drop collected over different voltages from 0.8 to 1.6 V.

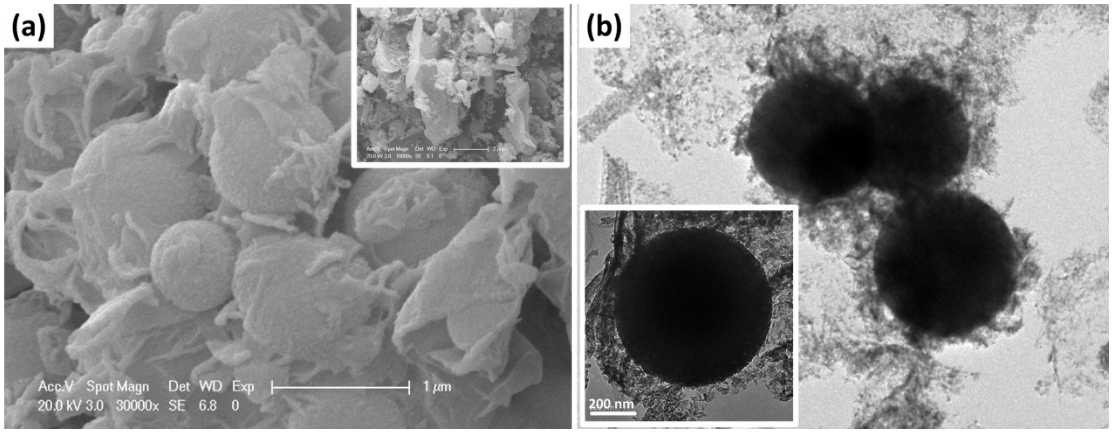

Figure S7. (a) SEM and TEM images of electrode materials after cycling for 7000 cycles.