

Electronic Supplementary Material (ESI)

**Vanadium Pentaoxide Doped Waste Plastic Derived Graphene
Nanocomposite for Supercapacitors: A Comparative Electrochemical
Study of Low and High Metal Oxide Doping**

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Three-electrode system-based evaluations of cell-1 and cell-2:

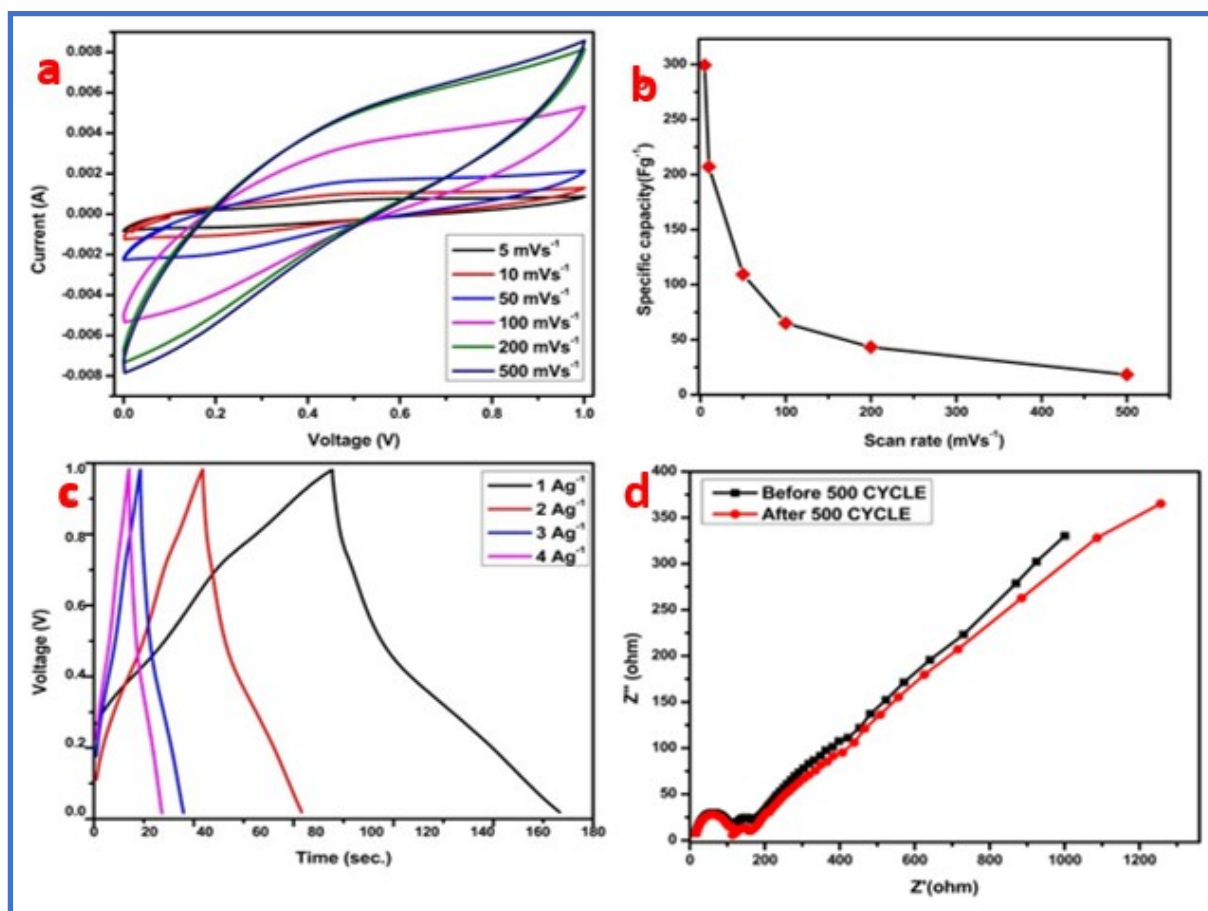


Figure S1: (a) CV plots of WGSA at different scan rates; (b) specific capacity versus scan rate plot of WGSA; (c) GCD plots at different current densities of WGSA; (d) EIS plots before and after 500 cycles for WGSA.

Further, the specific capacitance of cell-1 and cell-2 in the three-electrode system was calculated using the equation S1.

$$C_s = \frac{A}{mKV} \quad (S1)$$

The specific capacity decreased with increasing scan rate also supported by the GCD and EIS data. GCD showed good quantum efficiency for WGSA while lower stability of WGSB. The EIS data showed clear differences in the patterns of the device after performing 500 cycles for WGSA and WGSB. This indicates on higher cycle stability both devices showed high sheets resistance may be due to material degradation. However, higher values of specific capacitance were obtained for WGSA in comparison to WGSB.

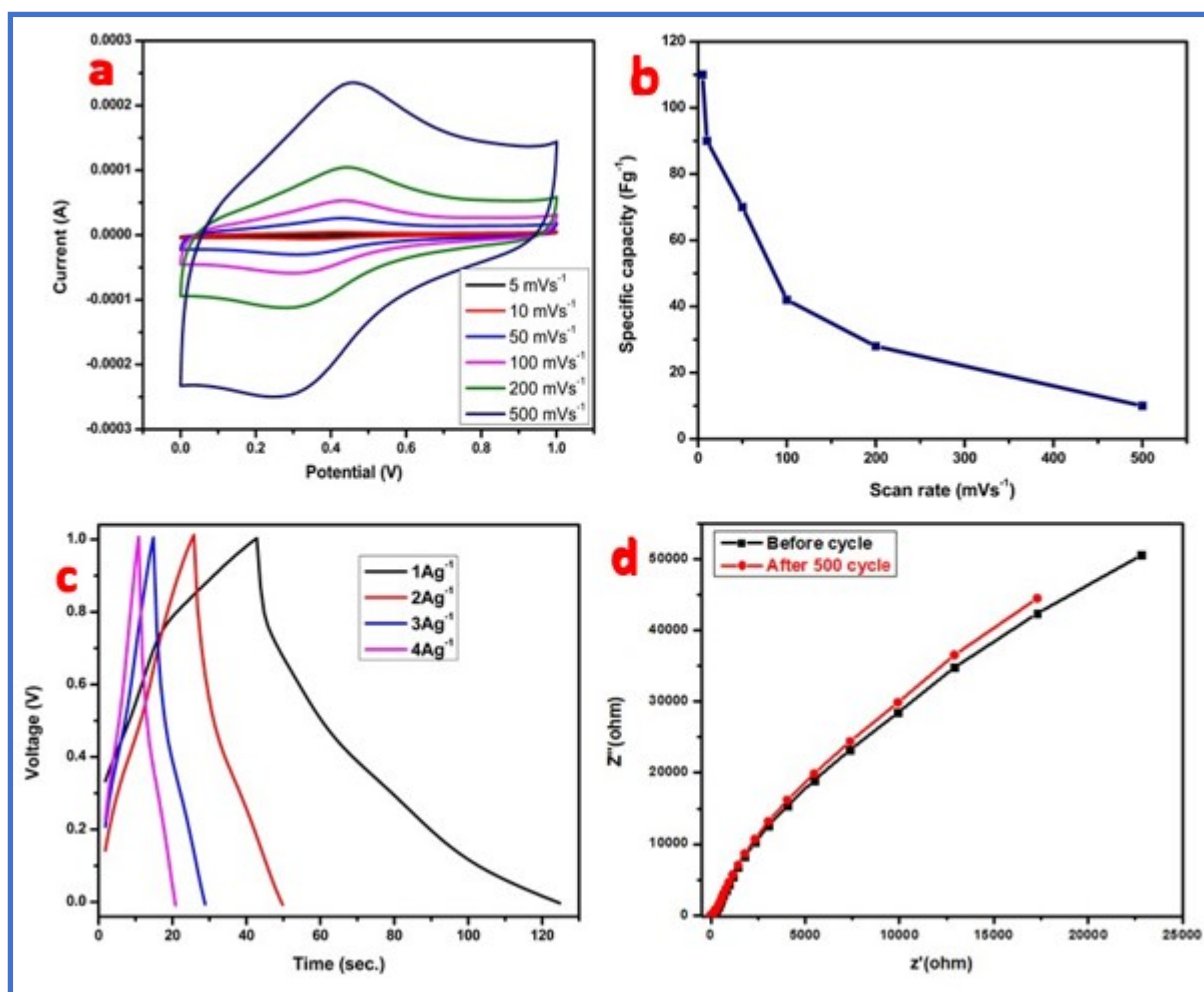


Figure S2: (a) CV plots of WGSB at different scan rates; (b) specific capacity versus scan rate plot of WGSB; (c) GCD plots at different current densities of WGSB; (d) EIS plots before and after 500 cycles for WGSB

Table S1: Specific capacitance (Cs) calculated by the three-electrode system through CV plot for Cell 1 and Cell 2.

Scan rates (in mVs ⁻¹)	5	10	50	100	200	500
Cs of cell 1 (in Fg ⁻¹)	299.20	207.22	109.34	64.98	43.26	18.26
Cs of cell 2 (in Fg ⁻¹)	110.02	90.80	70.26	42.09	28.65	9.02

