Supplementary Information

Three-dimensional Nickel Vanadium layered double hydroxide nanostructures grown carbon cloth for high-performance flexible supercapacitor applications

Ankit Tyagi,[a] Manish Chandra Joshi,[a] Kushagra Agarwal,[a] Bhuvaneshwari Balasubramaniam,[a] and Raju Kumar Gupta*[a,b]

[a] Department of Chemical Engineering, Indian Institute of Technology Kanpur, Kanpur 208016, UP, India

[b] Center for Environmental Science and Engineering, Indian Institute of Technology Kanpur, Kanpur-208016, UP, India

*Corresponding author. Tel: +91-5122596972; Fax: +91-5122590104.

E-mail address: guptark@iitk.ac.in

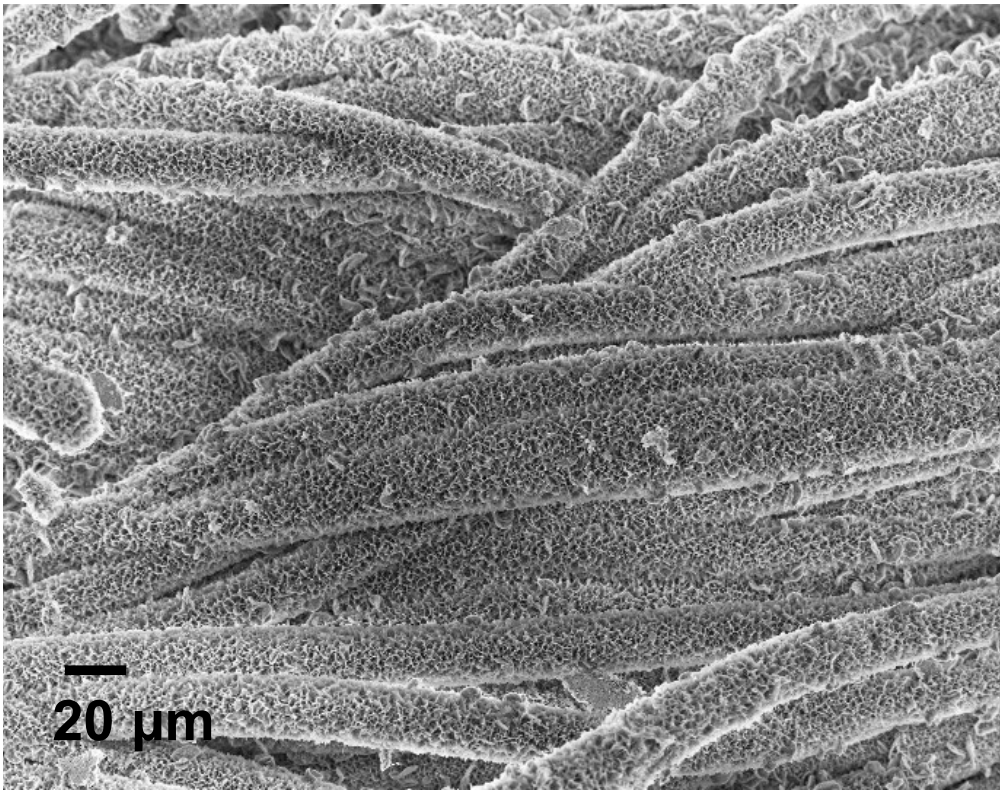

Fig. S1 Low magnification FESEM image for NVL@CC.

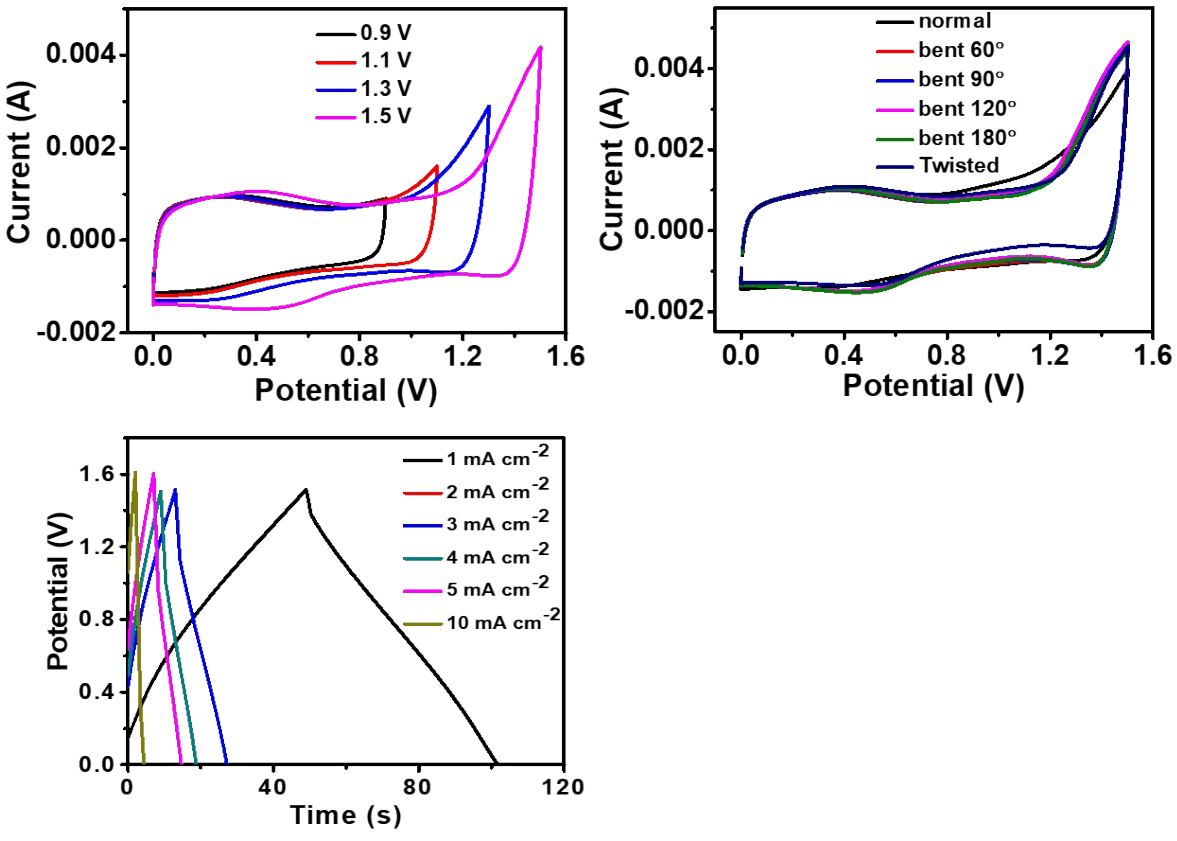

Fig. S2 (a) CV curves for NVL@CC//AC HSC at a scan rate of 10 mV s^{-1} at different potential

windows; (b) CV curves for NVL@CC//AC HSC at a scan rate of 10 mV s^{-1} at different bending and twisting state; (c) GCD curves for NVL@CC//AC HSC at various higher current densities.

Activated carbon coated carbon cloth

Electrochemical characterization for activated carbon coated carbon cloth is presented in Fig. S4. The CV and GCD curves show that activated carbon coated carbon cloth can work in -1 to 0 V potential window, which helps in improving the NVL@CC//AC HSC voltage window to 1.5 V. The average specific capacitance of 6 such electrodes is shown in Fig. S4d. The specific capacitance at 3 A g^{-1} is used to calculate the optimum mass ratio of positive and negative electrodes.

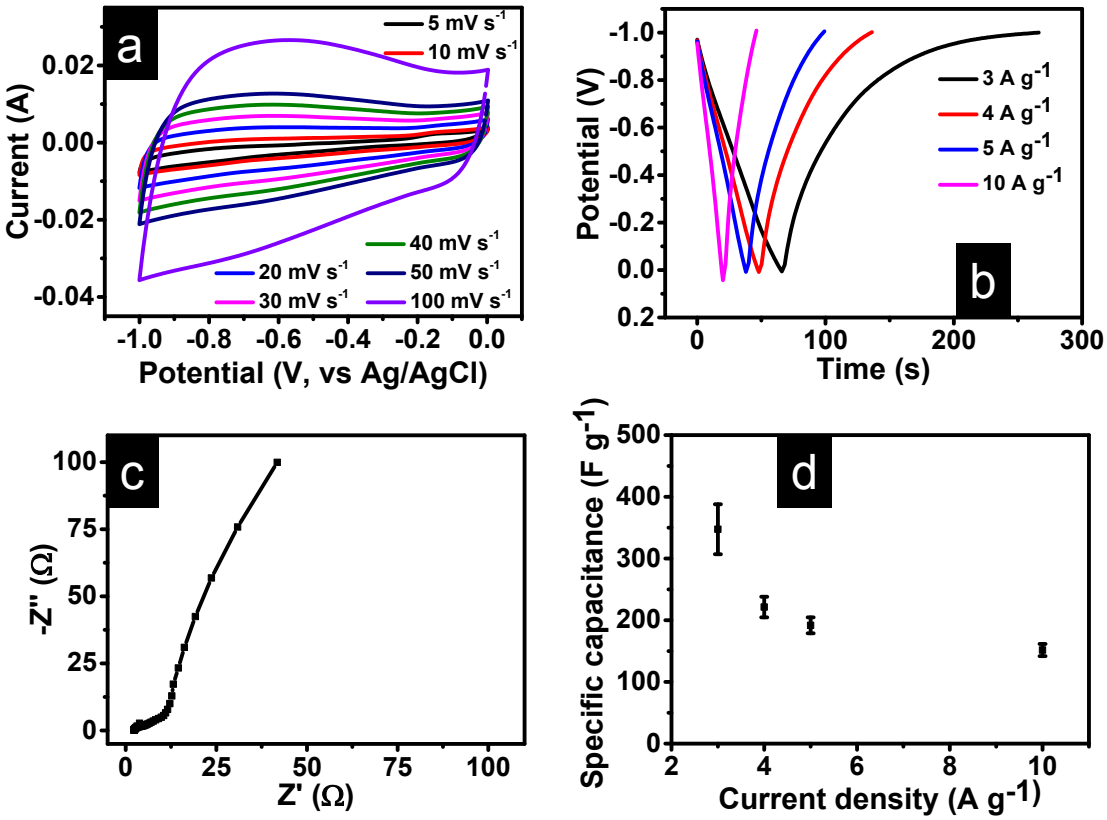

Fig. S3 (a) CV curves for activated carbon coated carbon cloth at various scan rates; (b) GCD curves for activated carbon coated carbon cloth at various current densities; (c) EIS spectra for

activated carbon coated carbon cloth; (d) Variation of specific capacitance with current density for activated carbon coated carbon cloth.

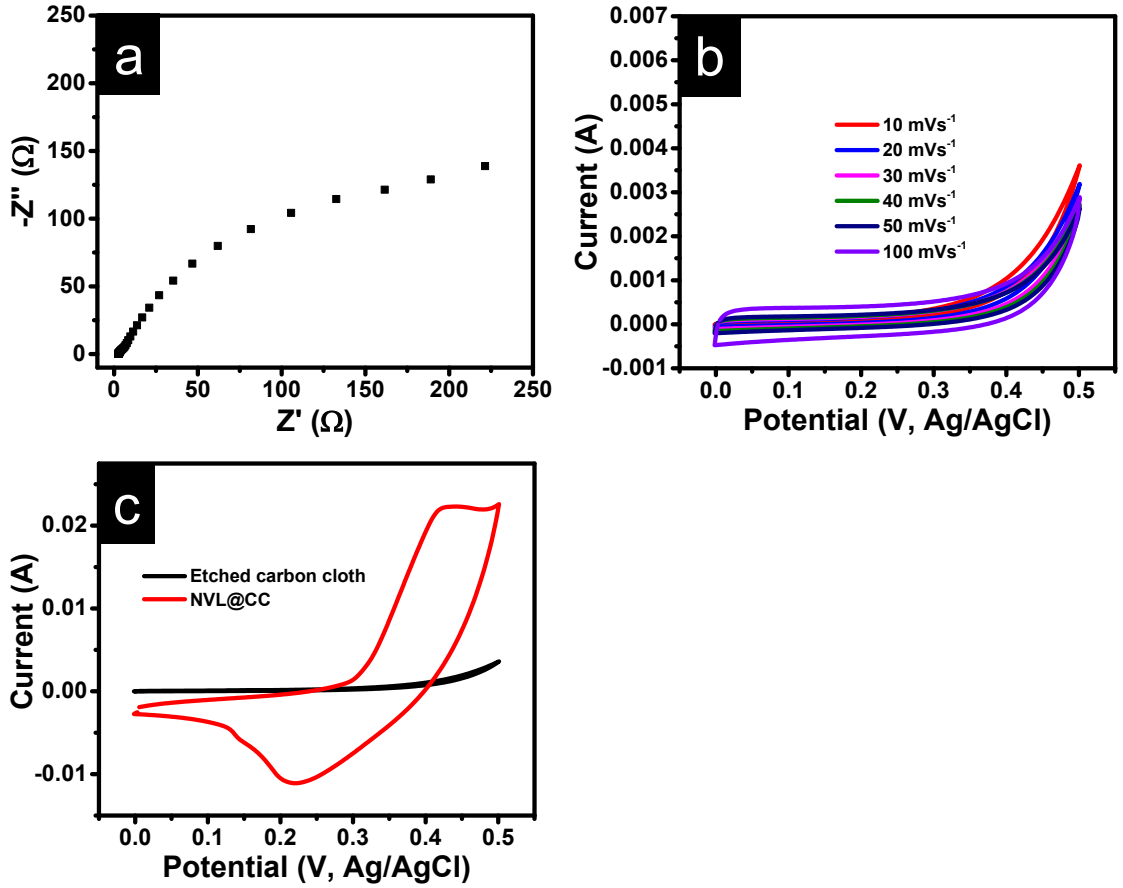

Fig. S4 (a) EIS spectra for etched carbon cloth; (b) CV curves for etched carbon cloth at various scan rates; (c) Comparison of NVL@CC and etched carbon cloth CV curve at 10 mV s^{-1} scan rate.