

Electronic Supplementary Information

Nanodiamond-based TiO₂ Nanocomposite Separators for Enhancing Performance of Flexible Paper-based Supercapacitors

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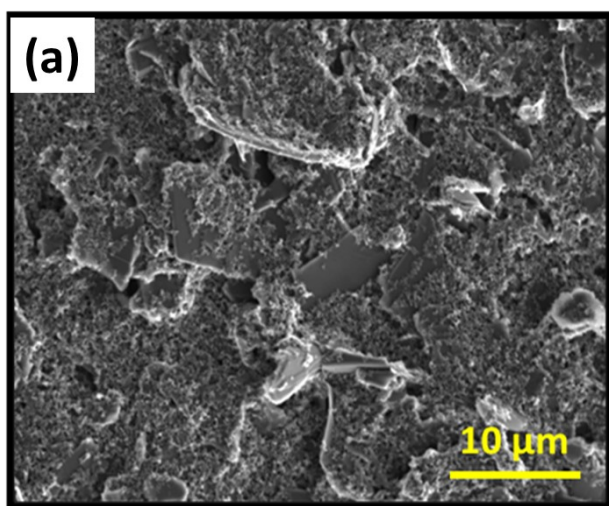


Figure S1: SEM images of the carbon electrodes.

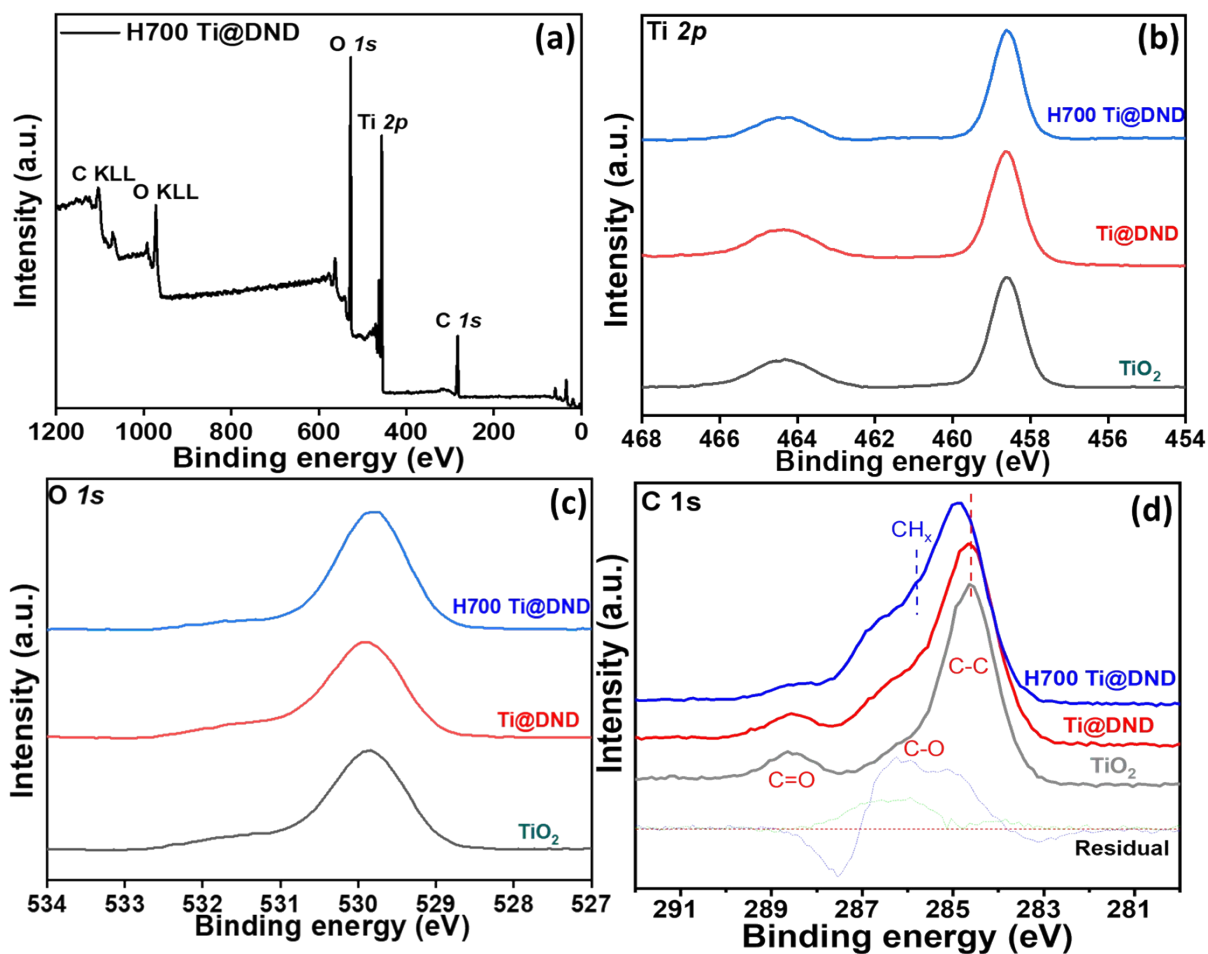


Figure S2: (a) Survey spectra of H700 Ti@DND. Comparative spectra of TiO₂, Ti@DND and H700 Ti@DND of (b) Ti 2*p*, (c) O 1*s*, and (d) C 1*s* peaks.

Sample	Atomic concentration, at. %					O/Ti
	C _{adv}	C _{adv} -O	Ti	O	N	
TiO ₂	18.2	10.4	21.0	49.5	0.9	1.9
Ti@DND	25.9	9.5	18.5	45.3	0.8	1.9
H700 Ti@DND	33.5	8.4	17.6	40.0	0.5	1.8

Table ST1: Atomic concentration of Ti, N and O in TiO₂, Ti@DND and H700 Ti@DND.

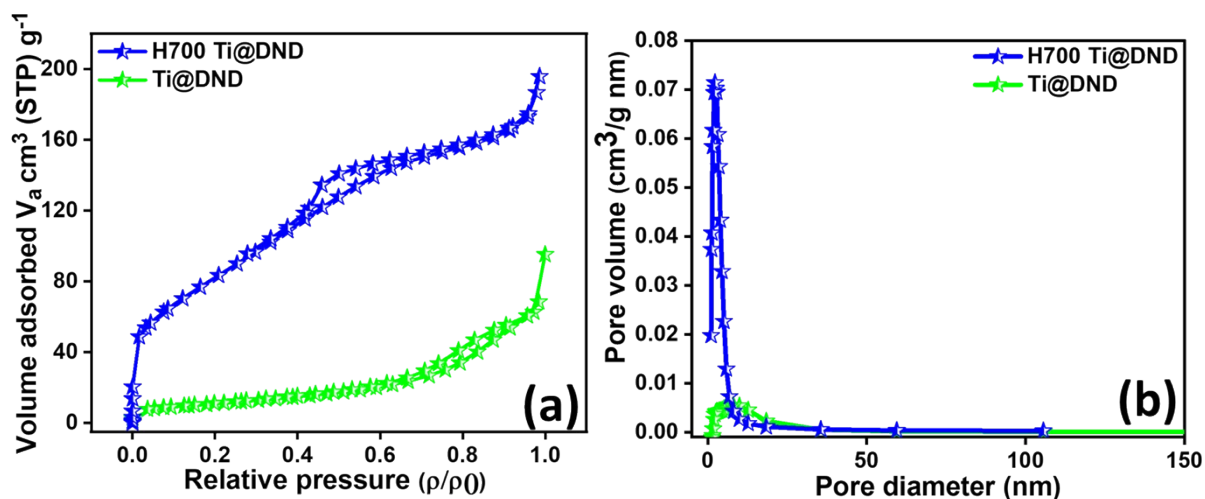


Figure S3: (a) BET surface area analysis of Ti@DND and H700 Ti@DND and (b) image showing the graph of pore size distribution of both the samples.

Sample name	Surface area (m ² /g)	Pore diameter (nm)	Pore volume (cm ³ /g)
Ti@DND	309	3.92	0.302
H700 Ti@DND	40	12.9	0.129

Table ST2: Values of surface area, pore diameter and pore volume of Ti@DND and H700 Ti@DND samples.

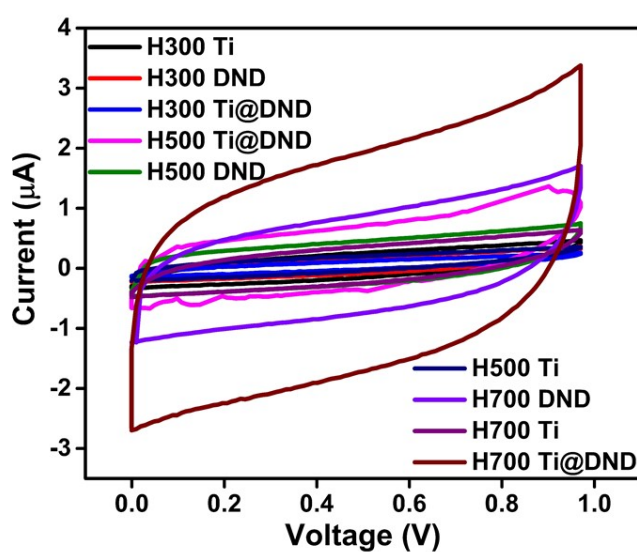


Figure S4: CV curves of all the hydrogenated samples at a constant scan rate of 100 mV/s.

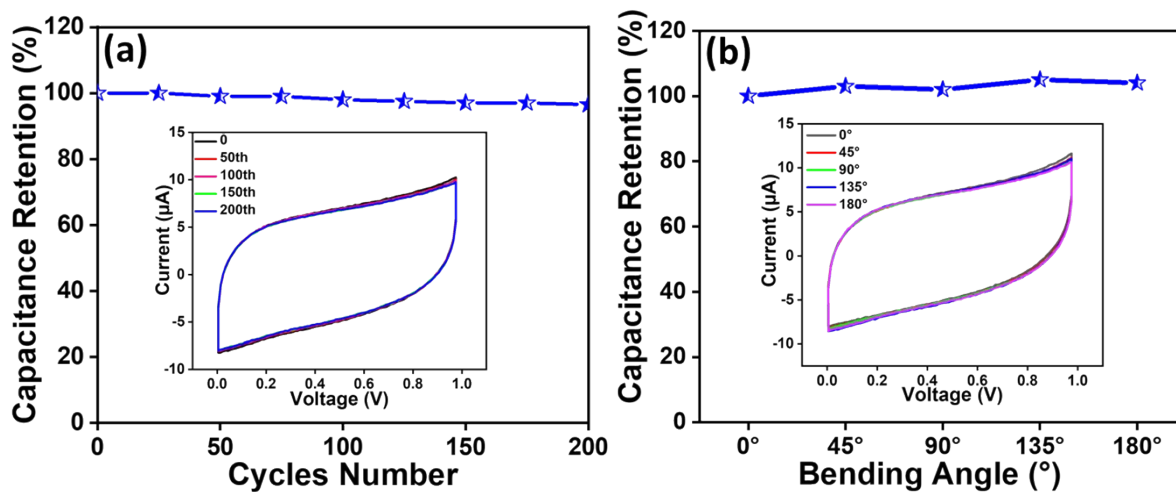


Figure S5: Flexibility test: (a) capacitance retention after 200 bending cycles, inset CVs at different bending cycles and (b) capacitance retention with various bending angles, inset showing CVs at different angles

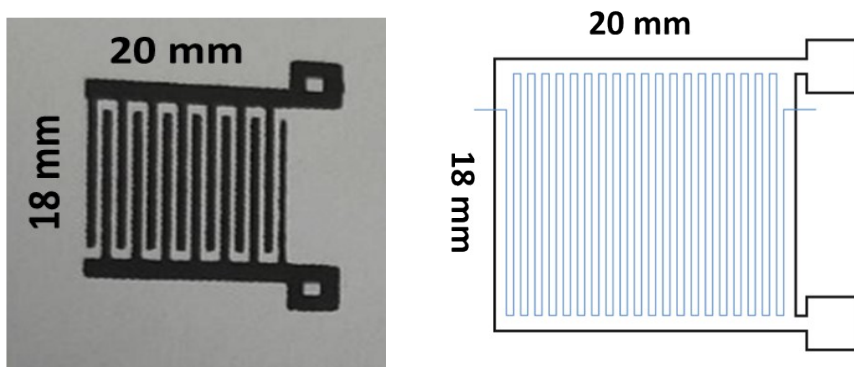


Figure S6: Photograph and patterning scheme of the supercapacitor electrodes.