Electronic Supplementary Material (ESI) for Nanoscale

Integrated Random-Aligned Carbon Nanotube Layers: Deformation Mechanism under Compression

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Supporting Information

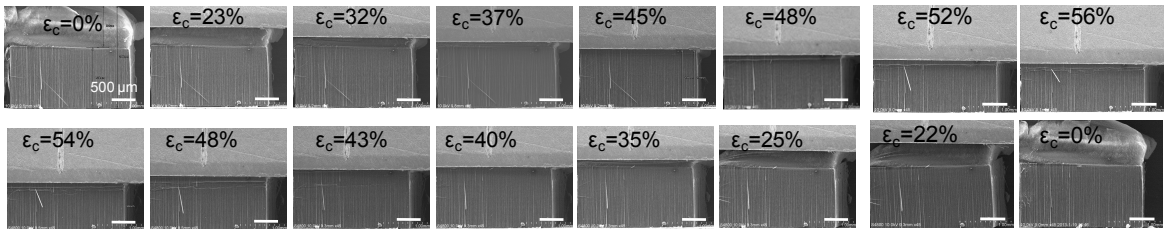

Fig. S1 Low magnification SEM observed the deformation process of the double layered structure with the compressive strain gradually increased to 56% and then decreased to 0 %. ε_c is the strain of the composite.

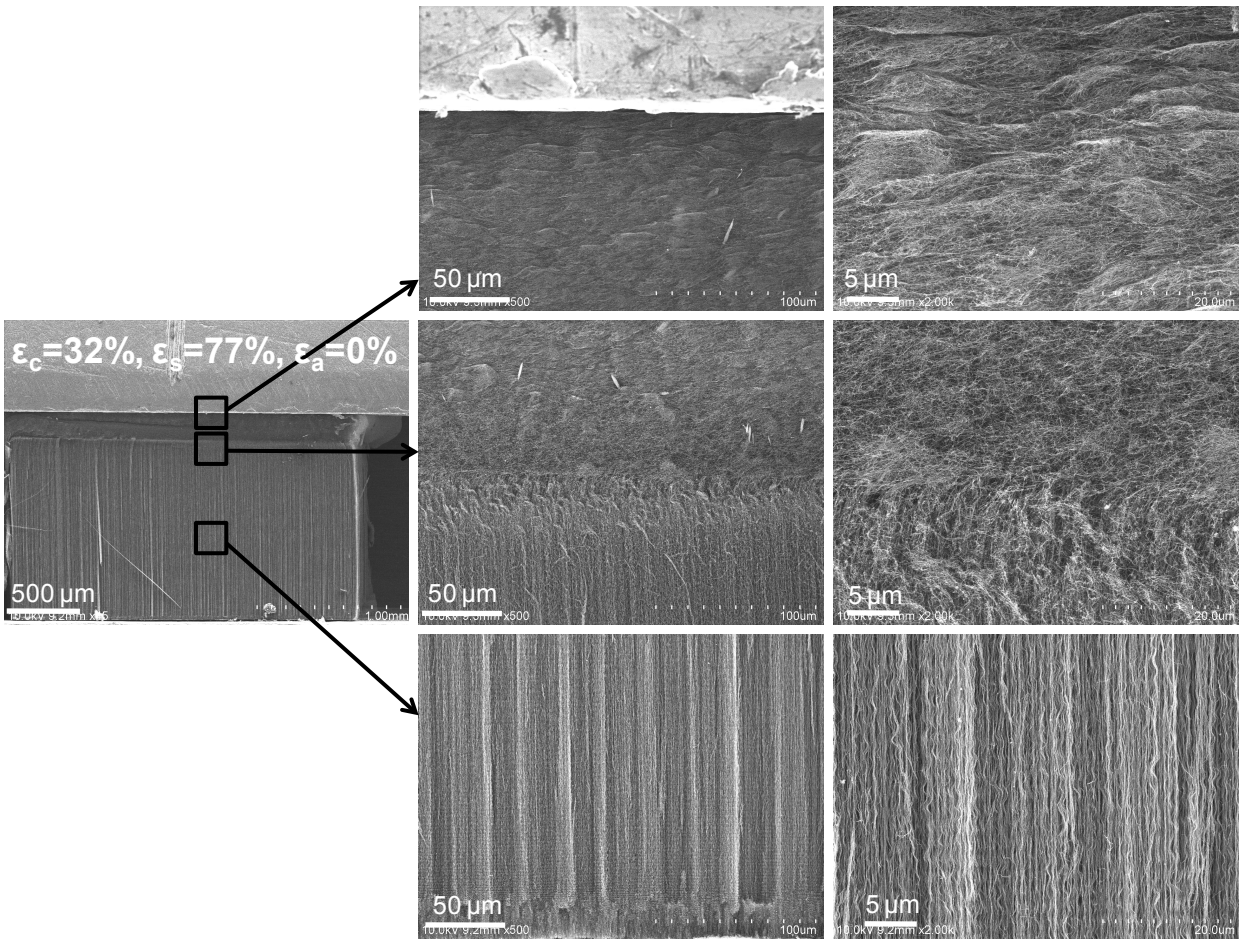

Fig. S2 SEM images of sponge-array double layered structure under the compressive strain of 32 %.

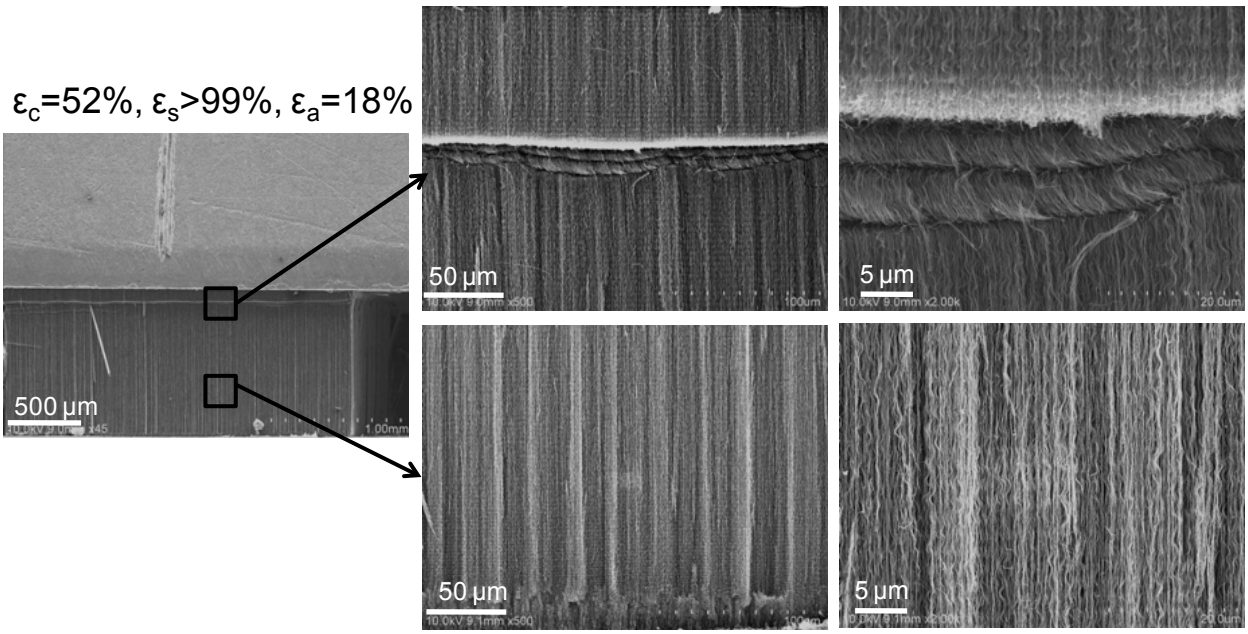

Fig. S3 SEM images of sponge-array double layered structure under the compressive strain of 52 %.

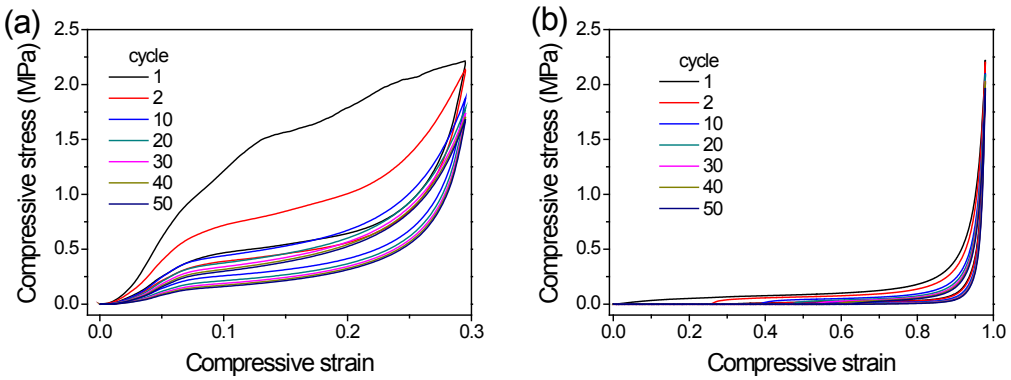

Fig. S4 (a) Compressive stress-strain curves of a CNT array for 50 cycles. (b) Compressive stress-strain curves of a CNT sponge for 50 cycles.

Table S1. Energy absorption, energy dissipation, and energy loss coefficient ($\Delta E/E$) values of the composite, sponge and array

Samples	Cycle	Energy absorption (KJ/m^3)	Energy dissipation (KJ/m^3)	$\Delta E/E$
Sponge	1^{st}	160.0	108.2	0.68
	50^{th}	56.7	28.7	0.51
Array	1^{st}	405.5	228.2	0.56
	50^{th}	140.1	48.5	0.35
Double-layered composite	1^{st}	282.8	181.8	0.64
	50^{th}	92.2	38.5	0.42