Supporting information

Mechanical Properties of Carbon Nanotube Fibers at Extreme Temperatures

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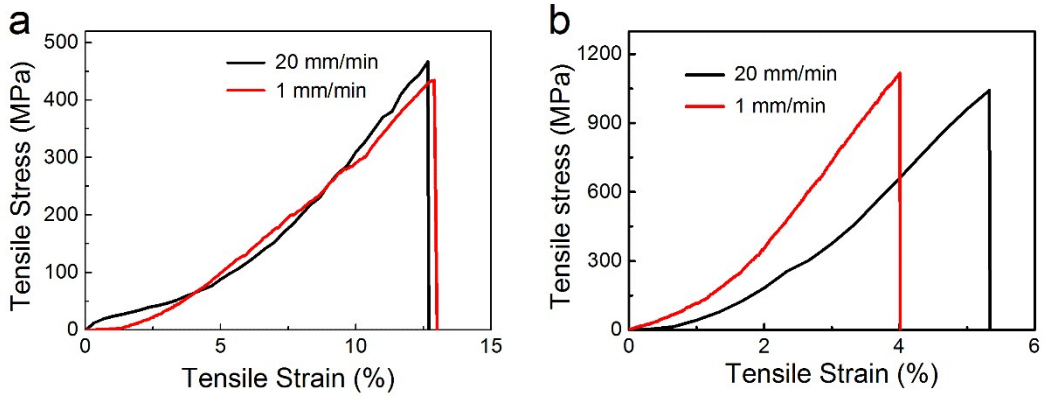


Fig. S1 a. Typical tensile stress-strain curves of CNT fibers at 1000 °C at different tensile rates. b. Typical tensile stress-strain curves of CNT fibers at -196 °C at different tensile rates.

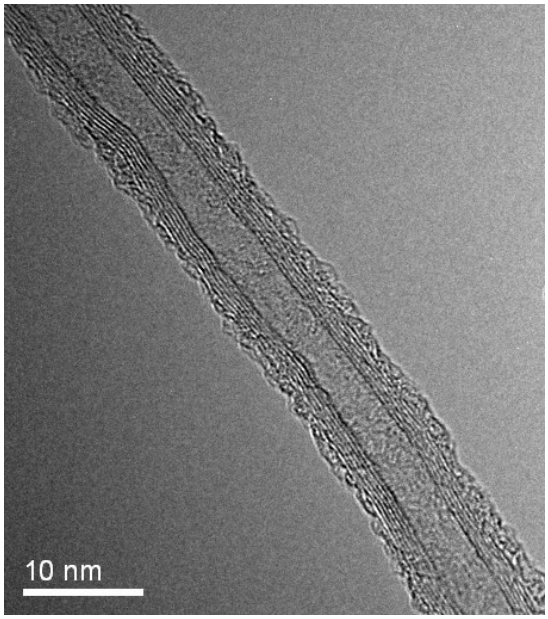
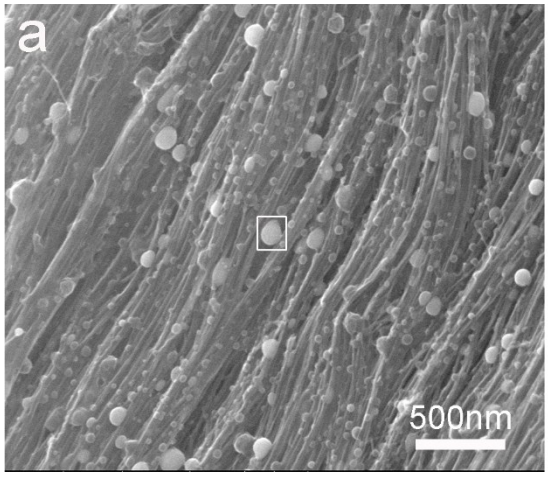


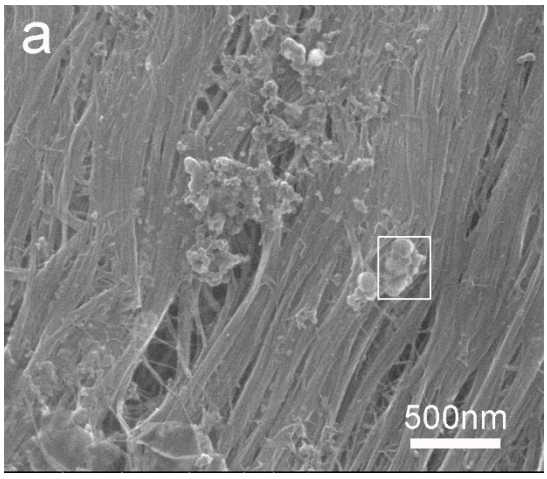
Fig. S2 Transmission electron microscope (TEM) image of the used CNTs, which have 6-8 graphitic walls and a diameter of about 10 nm.



b

Element	Wt %	At %
C K	77.08	90.23
O K	05.54	04.87
Fe K	17.38	04.09

Fig. S3 a) SEM image of the CNT fiber after heat treatment at 2000 ºC and b) the corresponding element content that was obtained by EDS of the particle selected by white rectangle in a).



b

Element	Wt %	At %
C K	93.94	95.38
O K	06.06	04.62

Fig. S4 a) SEM image of the acid treated CNT fiber, which was immersed in concentrated hydrochloric acid for 2 hours, after heat treatment at 2000 ºC and b) the corresponding element content that was obtained by EDS of the particle selected by white rectangle in a).

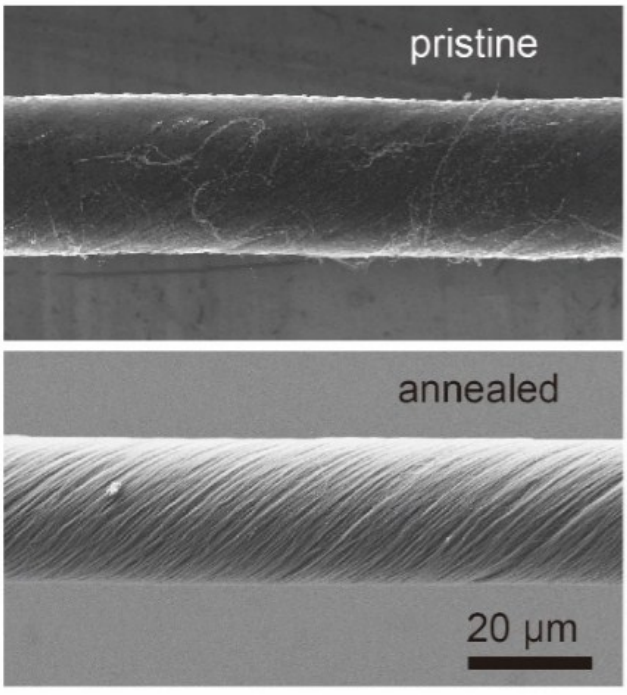


Fig. S5 SEM images of CNT fibers spun from CNT arrays. a) Pristine CNT fiber. b) CNT fiber after heat treatment at 2000 ºC for 30 minutes.

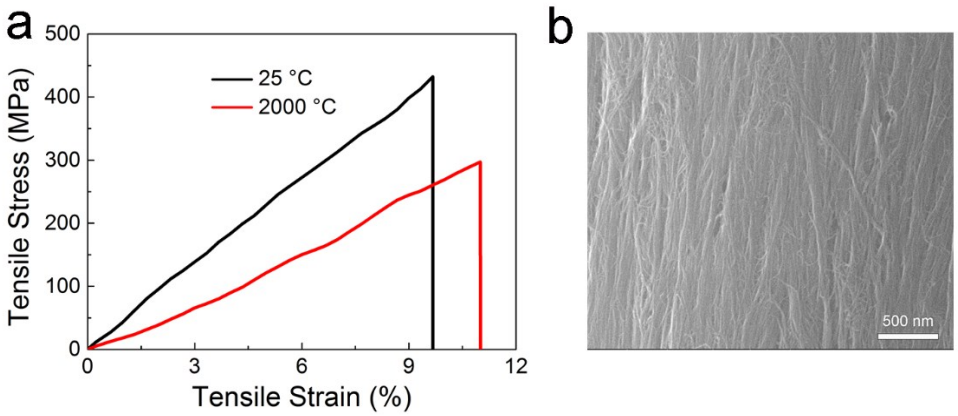


Fig. S6 Typical tensile stress-strain curves of CNT fibers spun from CNT arrays at 25 °C and 2000 °C. Fig. 3b SEM image of the CNT fiber spun from the CNT arrays after the 2000 °C tensile test.

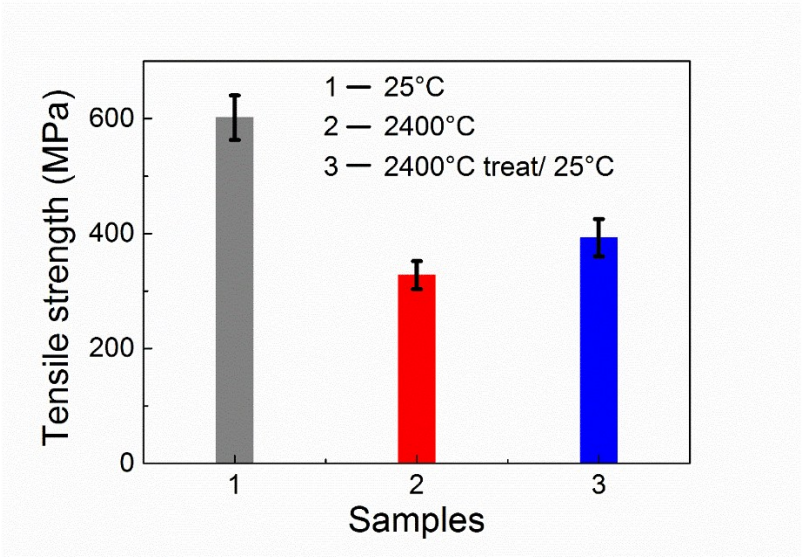


Fig. S7 Tensile strength of CNT fibers before and after 2400 ºC heat treatment under different testing temperatures.