

Efficient Purification of Single-Walled Carbon Nanotube Fibers by Instantaneous Current Injection and Acid Washing

Shuhui Li,¹ Yuanyuan Shang,^{1*} Weiqi Zhao,² Chunfei Hua,¹ Ying Wang,¹ Xinjian Li,¹ Anyuan Cao^{2*}

¹ School of Physical Engineering, Zhengzhou University, Zhengzhou, Henan 450052, China

² Department of Materials Science and Engineering, College of Engineering, Peking University, Beijing 100871, P. R. China

Supporting Information

Figure S1. SEM images of the inside of a purified SWNT fiber.

Figure S2. TGA curves of as-spun fibers, purified samples carried out in air and in N₂ up to 1000 °C.

Figure S3. SEM characterization on the wrinkled morphology of purified SWNT fibers.

Figure S4. SEM images of a pristine fiber and purified fiber using only acid/H₂O₂ treatment (without current injection) as control sample.

Figure S5. Stress–strain curves of the purified fibers with different gauge lengths of 10 mm and 40 mm, respectively.

Figure S6. SEM images of fracture surface of the purified SWNT fibers.

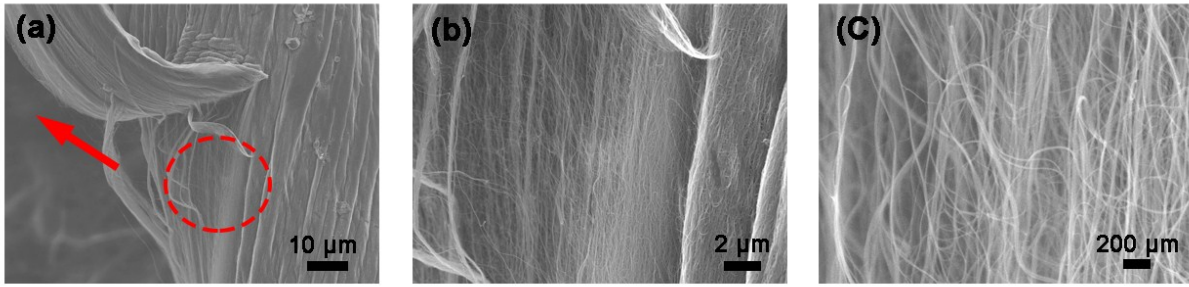


Figure S1. SEM images of the inside of a purified SWNT fiber. The surface part has been lifted up so that the internal region can be examined. There are no traces of residual catalyst particles inside the fiber.

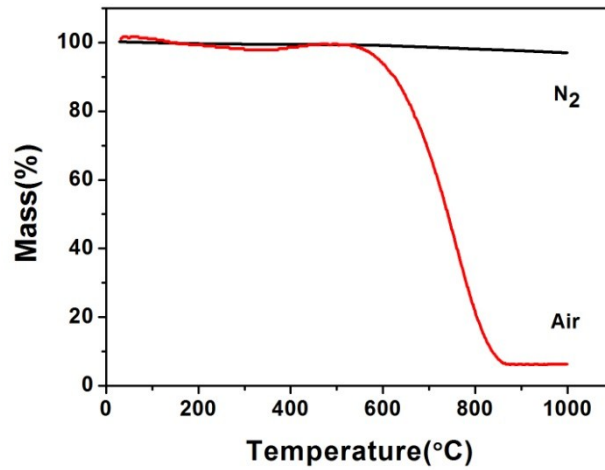


Figure S2. TGA curves of purified CNT fibers carried out in air and in N₂ up to 1000°C, respectively.

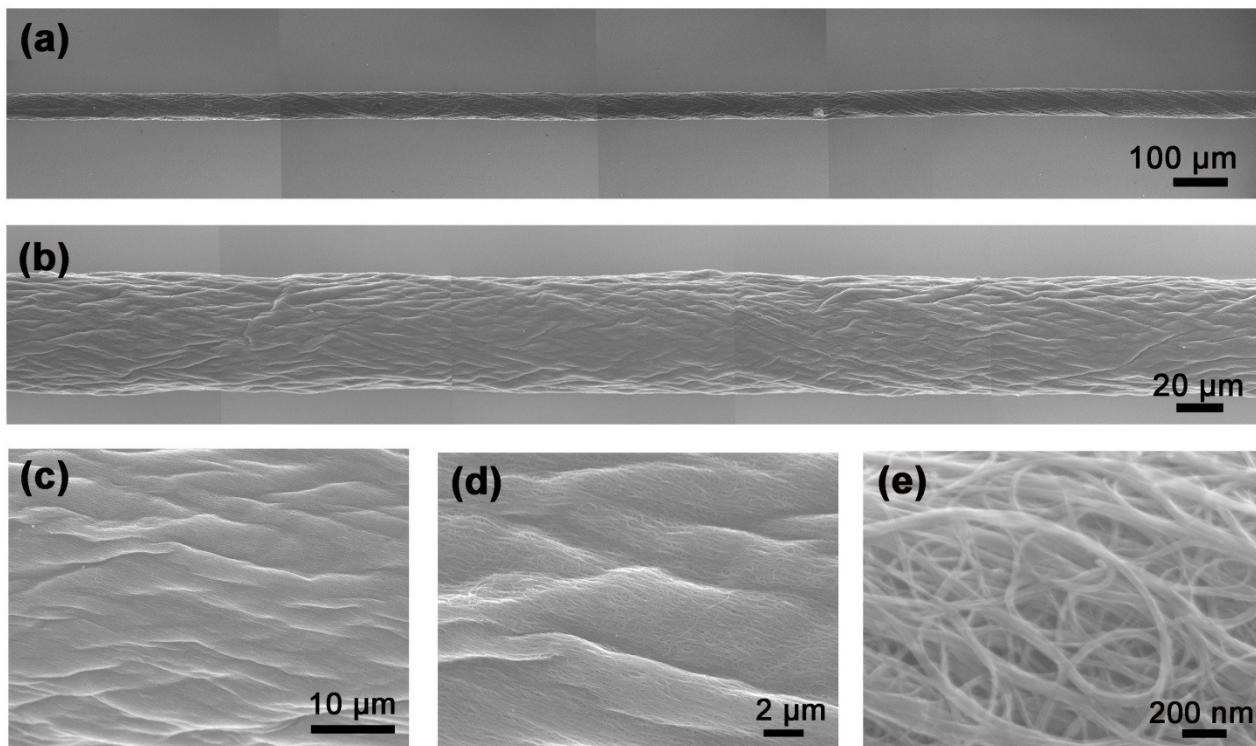


Figure S3. SEM characterization on the wrinkled morphology of purified SWNT fibers. (a)-(e) SEM images of a purified fiber from low to high-magnification views.

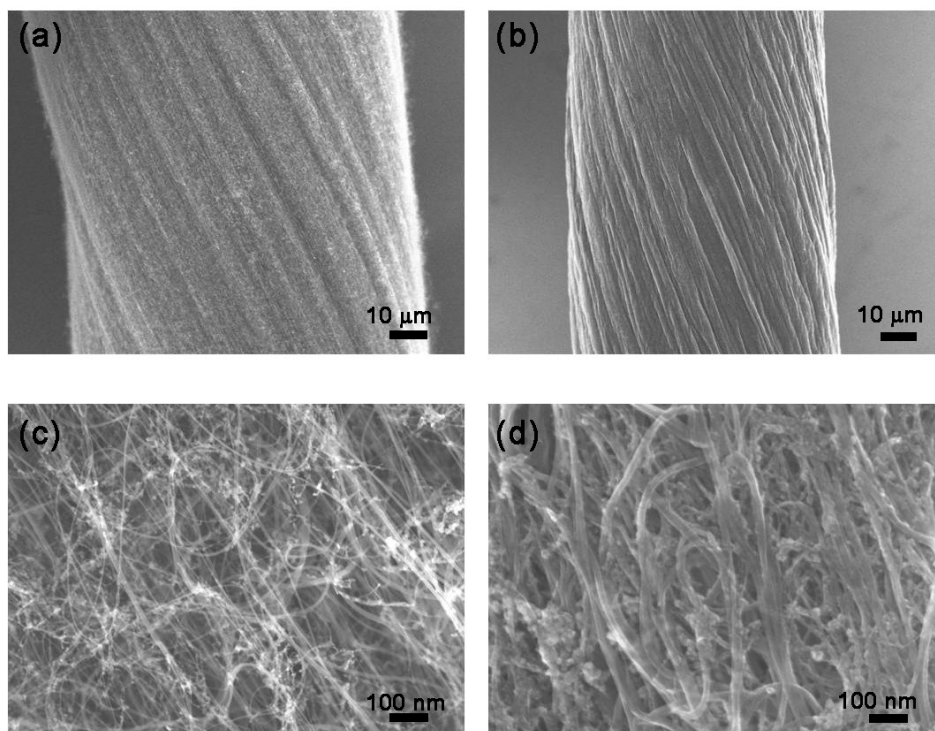


Figure S4. (a) and (c) SEM images of a pristine fiber. (b) and (d) SEM images of a purified fiber using only acid/H₂O₂ treatment (without current injection) as control sample. Without current injection, there remain a significant amount of impurities trapped within the fiber.

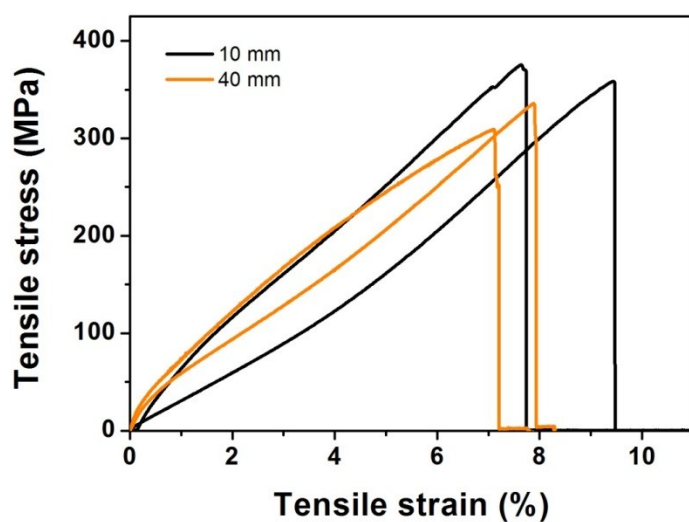


Figure S5. Stress–strain curves of the purified fibers with different gauge lengths of 10 mm and 40 mm, respectively.

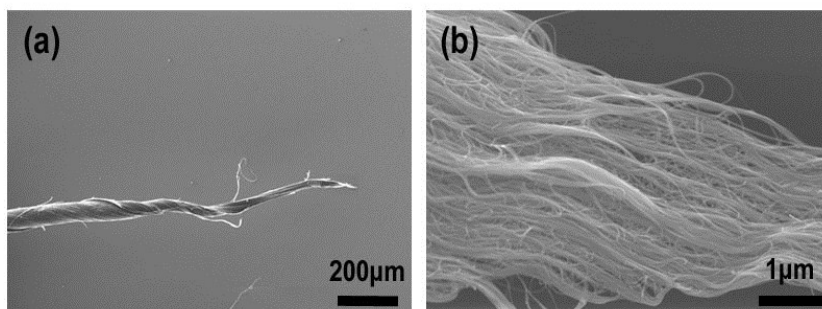


Figure S6. SEM images of the fractured surface of the purified SWNT fibers. (a) Low-magnification SEM image of the fractured surface in a SWNT fiber after tensile testing. (b) High-magnification view of the fractured surface.