

Abstract Submitted
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Planarizing Single-Walled Carbon Nanotube Fibers MICHELLE PREWITT¹, Texas Christian University, NOLAN NICHOLAS, JAE JANG, ERIK HAROZ, MYUNG KIM, HONGWEI SHAN, RICHARD SMALLEY, Rice University — Planarization of single-walled carbon nanotube (SWNT) fibers was performed to produce a clean, level fiber surface of open-ended nanotubes. Low pressures, approximately 50 mTorr – 1.0 Torr, of gas were introduced into the planarizer. The planarizer is a vacuum system that contains the heated catalytic foil and the fiber. The foil and gas react to create an aggressive species that is localized on the foil. Since the end of the fiber can be moved into contact with the foil, carbon and impurities can be removed from the end of the fiber and escape in the gas phase. The effect of change in temperature, pressure, and other variables, were tested to determine conditions that allow the end of the fiber to be etched without damaging the sidewalls of the nanotubes. The clean fibers can then be used for continued growth resembling 1D molecular epitaxy. Raman spectroscopy suggests that continued growth from a fiber produces SWNT that are identical to the ones present in the fiber. Thus, continued growth is a process that can produce specific types of SWNT, which is important because the properties, and therefore uses, of the nanotubes depend on their diameter and chirality.

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