Transmission Electron Microscopy Study of Individual Carbon Nanotube Breakdown Caused by Joule Heating in Air - DTU Orbit (07/01/2019)

We present repeated structural and electrical measurements on individual multiwalled carbon nanotubes, alternating between electrical measurements under ambient conditions and transmission electron microscopy (TEM). The multiwalled carbon nanotubes made by chemical vapor deposition were manipulated onto cantilever electrodes extending from a specially designed microfabricated chip. Repeated TEM investigations were then made of the progressive destruction of the nanotube structure induced by Joule heating in air. The electrical measurements indicate that the studied nanotubes behave as diffusive conductors with remarkably predictable electrical properties despite extensive structural damage.

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Contributors: Mølhave, K., Gudnason, S., Pedersen, A. T., Clausen, C. H., Horsewell, A., Bøggild, P.
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