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**In Situ Measurement of Noise and Resistance Reductions During the High Temperature Anneal of Single-Walled Carbon Nanotubes**  
ALEXANDER KANE, BRETT GOLDSMITH, PHILIP COLLINS, University of California, Irvine — The use of high temperature treatments is increasingly common in the post-processing of lithographically-fabricated carbon nanotube electronic devices. Empirically, high temperature treatments decrease both the resistance and noise of as-fabricated devices through undetermined mechanisms. This work investigates the most effective processing temperatures by measuring devices in situ in a UHV environment. The measurements focus on metallic nanotubes contacted by Ti or Pd electrodes. The results clearly differentiate between the resistive effects of adsorbates and of non-ohmic nanotube-metal contacts, since the two are eliminated at different temperatures and with different degrees of reversibility. The two mechanisms also affect device noise and fluctuations differently, with the net effect that noise decreases are more than proportional to resistance decreases.

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