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Hysteresis effect on I (V) measurements in (SWCNT) based sensors with different electrodes

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Single-walled carbon nanotubes (SWCNT) have excellent electronic, thermal and mechanical properties that make them attractive for potential use in radio-frequency, electronics, and macro-electronic systems and in various types of gas sensing applications. Our device was fabricated with an array of four CNTFETs on the same chip, composed of four different metals (Pd, Pt, Au and Ti) as electrodes. In our previous work we have demonstrated that each CNTFET interacts in a very specific way with a specific gas, identifying a sort of electronics finger printing. In this work, we present several electrical results regarding SWCNT, we demonstrate that I_{ds} (V_{ds}) curves of the SWCNTs/Pt contact under various V_{gs} increase with increasing V_{gs} in dark conditions, but for device with Pd contact the current decreases when we increase gate voltage. In the same context the hysteresis will be important for sample with Pt contact than for devices with Pd electrodes. This effect may be attributed to traps localized in the interface SiO_2/CNT . Finally, in the same paper, we present the effect of electrode length for SWCNTs with Pd electrodes. Compatibility with flexible substrates of these materials make them as unique candidate for solar cells. Their incorporation in energy storage device such as super-capacitor (physical charge storage device having faster/higher power density, lower energy density and lower internal resistance) provides balance between the energy storage and source.

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