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Core-Shell Nanotubes to Enhance Electrical Bistability for 2-bit Memory

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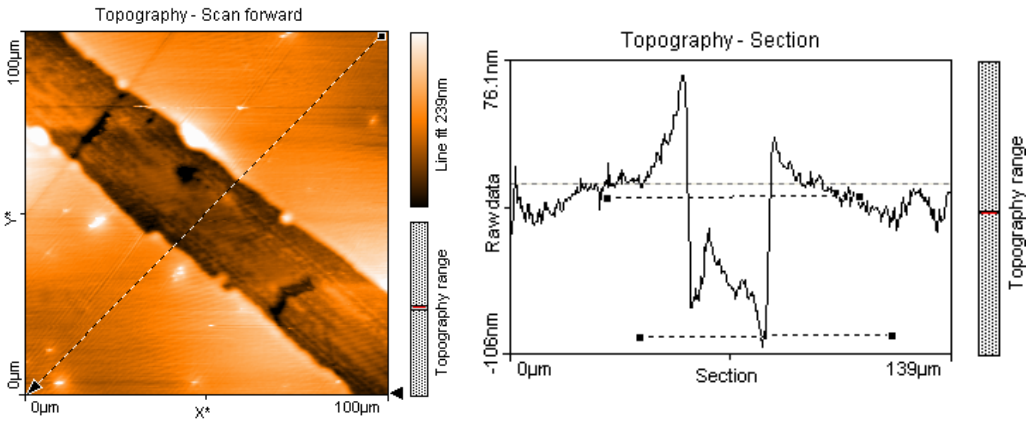
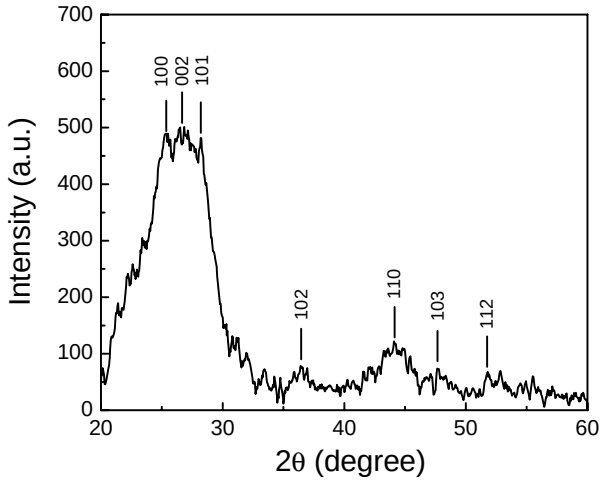
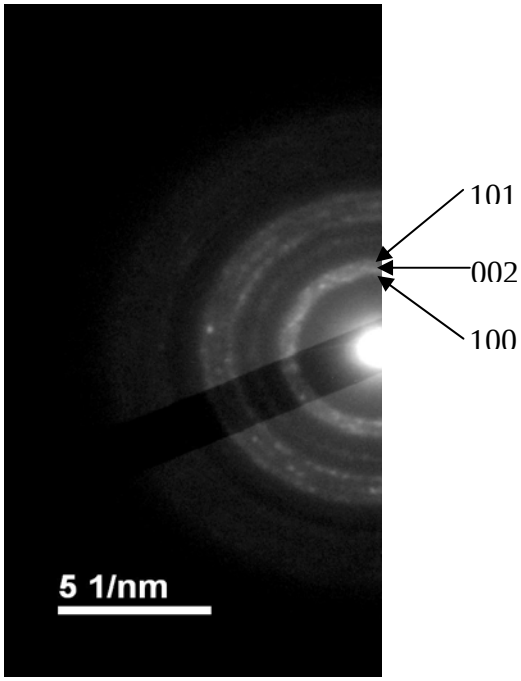


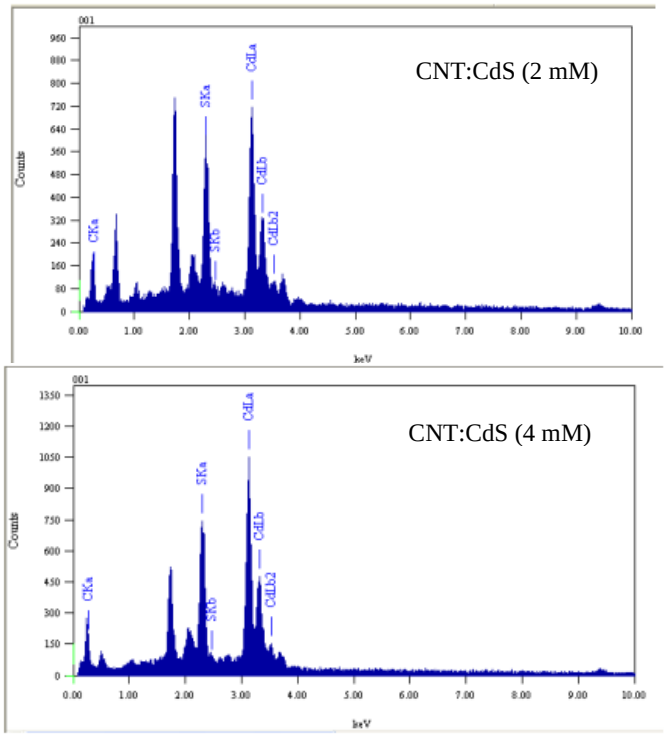
Supporting Figure 1. AFM topography of a scratched film (left figure) along with the depth profile of the scratch. The film that has been characterized is a spun-cast one based on CNT:CdS (2 mM) in PVP matrix.



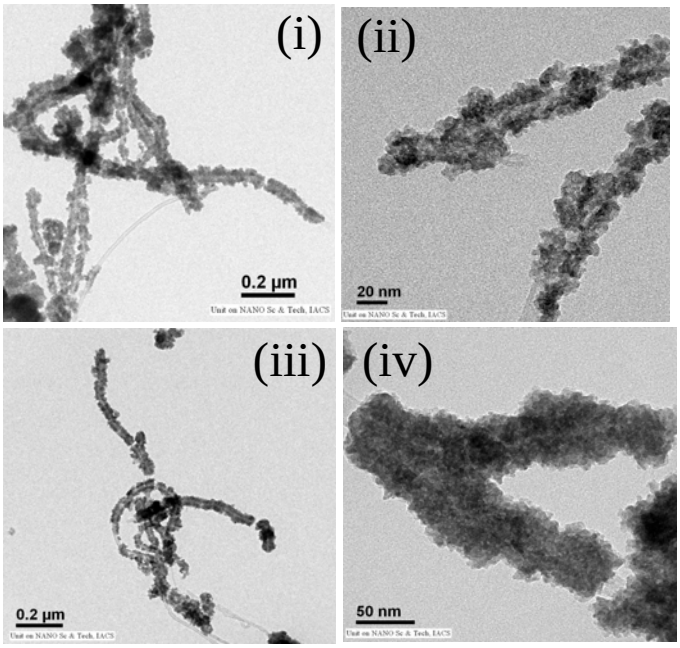
Supporting Figure 2. X-ray diffraction patters of CNT:CdS core-shells showing crystalline planes of hexagonal CdS.



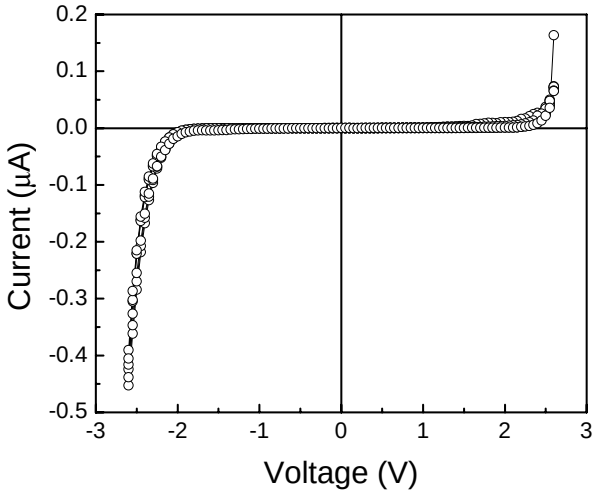
Supporting Figure 3. Selected Area Electron Diffraction (SAED) patterns of CNT:CdS core-shells. The lattice planes correspond to hexagonal structure of CdS (JCPDS No. 41-1049. Lattice parameters: a = 4.14 Å, c = 6.71 Å).



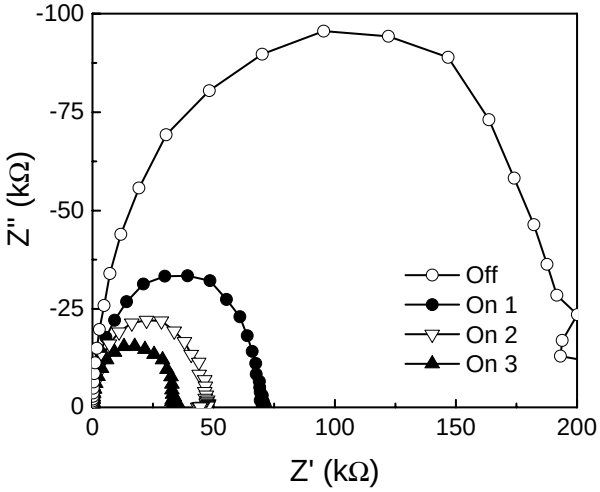
Supporting Figure 4. EDX analyses of CNT:CdS core-shells grown with different equimolar concentration of $CdCl_2$ and sulfur.



Supporting Figure 5. Additional TEM image CNT:CdS core-shells formed with 2 mM (i and ii) and 4 mM (iii and iv) of $CdCl_2$ and sulfur powder.



Supporting Figure 6. Current-voltage characteristics of a device based on PVP films with ITO and Al as electrodes. Characteristics under three voltage loops are presented in the figure.



Supporting Figure 7. Cole-Cole plots. Here real and imaginary component of complex impedance (Z’ and Z”, respectively) have been measured as a function of test frequency (100 mV, rms). Frequency-sweeps were carried out after application of +3.0, -2.6, -2.8, and –3.0 V pulse (width = 30 s) inducing the Off, On1, On2, and On3 states, respectively.