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Propositions

belonging to the PhD thesis

Polymer-wrapped carbon nanotubes for high performance field effect transistors

Volodymyr Y. Derenskyi

July 11th, 2017

1. The type of wrapping polymer strongly influences the transport characteristics of SWNT-FET, shifting it from ambipolar (PF12-wrapped SWNTs) to hole-dominated transport regime (P3DDT-wrapped SWNTs). (Chapter 2)
2. Semi-aligned SWNT networks demonstrate higher performance compared to random networks due to lower number of nanotube-nanotube junctions in the percolation path. (Chapter 2 and 3)
3. The anomalous behavior of the hole and electron conductivities at low temperature is a combination between the intrinsic charge transport in individual nanotubes and the percolation-type transport in the network. (Chapter 3)
4. Polyazomethine (PAMDD) demonstrates effectiveness in selecting semiconducting SWNTs with ultra-high purity (>99.9%). (Chapter 4)
5. Chemical self-assembly of SWNTs with thiol-functionalized polymers demonstrates excellent fabrication reliability and mechanical stability. (Chapter 5)
6. The polymer wrapped around the nanotube acts as a barrier for charge transport through the nanotube network in transistor.
7. The best time to plant a tree was 20 years ago. The second best time is now. (Chinese proverb)
8. The greatest pleasure you'll ever have is doing what others tell you you couldn't. (Walter Bagehot)
9. Your mind is the strongest and most valuable muscle you can grow in the gym.