

# Single-Walled Carbon Nanotubes Acting as Electronic Materials

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The unique structure of single-walled carbon nanotubes (SWCNTs) endows them excellent properties. Attributed to the very high and well-balanced carrier mobilities toward both electrons and holes and outstanding stability, SWCNTs have been considered as superior candidate channel materials for field-effect transistor and high-performance integrated circuits. For such applications, well-aligned SWCNTs with high semiconductor purity (99.9999%) and high density (100-200 tubes per micron) are needed. Therefore, the controlled preparation of SWCNTs becomes an essential requirement and also a key challenge. The possible route contains three steps: structure-controlled synthesis, solution phase separation and purification, and assembly. This presentation will briefly review the developments in synthesis, separation and assembly of SWCNTs in response to the requirements of information technology, and discuss its future prospects.