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**Chirality-controlled synthesis and macro-electronic applications of carbon nanotubes**

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Carbon nanotubes (CNTs) are promising materials for electronic applications due to their interesting properties. Chirality and electronic property controlled preparation are key challenges which need to be solved for practical use of CNTs in electronics. In this talk, I will first introduce our research on chirality-controlled synthesis of CNTs using metal-free carbon seeds. I will talk about chirality-controlled growth of SWCNTs using chirality-sorted nanotube seeds via a vapour phase epitaxy (VPE) cloning approach. Observations on the chirality-dependent growth rate and active lifetime of the nanotube seeds in the VPE process will be presented. Later, I will talk about selective growth of small diameter semiconducting CNTs using organic chemistry synthesized molecular seeds. In the second part, I will talk about the use of pre-separated, semiconducting-enriched CNTs for macro-electronics, printed electronics, and integrated circuits. Our work on the use of CNTs for thin-film transistors, CNT-IGZO hybrid CMOS circuits, and flexible, bendable, and transparent CNT devices and circuits will be presented. These works demonstrate the great potential of CNTs as advanced electronic materials.