

Structure-Controlled Synthesis of Single-Walled Carbon Nanotubes.

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Single-walled carbon nanotubes (SWCNTs) present outstanding properties determined by their structures. Structure-controlled synthesis of SWCNTs is one of the most important research topics in the field. We developed a strategy for the chirality-specified growth of SWCNTs by using a new family of catalysts — tungsten based intermetallic compounds. Relying on the statistic study of structures of SWCNTs grown at different conditions and the *in-situ* study of SWCNTs on catalysts using aberration-corrected environmental transmission electron microscope, we clarified the co-effects of catalysts and growth conditions on the selectivity of SWCNT growth at atomic scale. The structure-specified growth of SWCNTs can be achieved by manipulating the template effect of the catalysts together with the optimization of kinetic growth condition.