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**Periodic Patterning of Polyethylene Block Copolymers Directed by Carbon Nanotubes** BING LI, Drexel University, LINGYU LI, The Dow Chemical Company, CHRISTOPHER LI, Drexel University — Periodic patterning on one-dimensional carbon nanotubes (CNTs) is of great interest from both scientific and technological points of view. Although both chemical and noncovalent CNT functionalization have attracted extensive attention during the past decades, very few efforts have been dedicated to periodic patterning on individual CNTs. Recently, we demonstrated using a controlled polymer solution crystallization method to achieve periodically decorated CNTs. Polyethylene (PE) and Nylon 6,6 single crystals were controlled to grow on CNTs, forming a unique nanohybrid shish kebab (NHSK) structure. The periodicity was, however, not uniform because the concentration governed growth mechanism. Here we report improving the regularity of the periodic NHSK structures by employing block copolymers (BCPs), poly(ethylene-b-ethylene oxide) (PE-b-PEO), to produce NHSKs on CNTs. By crystallizing BCP on CNTs via thin film crystallization, periodic structures were generated along CNTs. The characteristic microphase separation of BCP was clearly observed, forming the striking alternating stripes perpendicular to the axes of individual CNTs. Furthermore, by functionalizing the PEO blocks with thiol groups, Au nanoparticles were subsequently immobilized on the PEO domains of the hybrid nanomaterial, replicating the periodic patterns.

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