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Polymer crystallization enabled carbon nanotube functionalization CHRISTOPHER LI, LINGYU LI, BING LI, CRISTIN YAVORSKY, Drexel University — CNTs were periodically decorated with polymer lamellar crystals using both controlled solution crystallization and physical vapor deposition methods, resulting in nano hybrid shish-kebab (NHSK) structures. The periodicity of the polymer lamellae varies from 20 - 100 nm. The kebabs are approximately 5 nm thick with a lateral size of 20 nm to micrometers, which can be readily controlled by varying the crystallization conditions. Both polyethylene and Nylon 6,6 have been successfully decorated on multi-walled as well as single-walled CNTs. The detailed formation mechanism was attributed to size dependent soft epitaxy. Since the polymer kebabs can be easily removed, these unique NHSKs can serve as templates to fabricate a variety of CNTs-containing hybrid materials with controlled pattering on the CNT surface. This method thus opens a gateway to periodical patterning on CNTs or similar 1D nanowires in an ordered and controlled manner.

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