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Improved Mechanical Properties by Grafting Nylon 6, 10 to Single Wall Carbon Nanotubes M. MONIRUZZAMAN, Department of Materials Science and Engineering University of Pennsylvania, Philadelphia, Pennsylvania 19104-6272, JAYANTA CHATTOPADHAY, WILLIAM E. BILLUPS, KAREN I. WINEY, DEPARTMENT OF CHEMISTRY RICE UNIVERSITY, HOUSTON, TEXAS COLLABORATION — We have prepared nylon 6, 10 nanocomposites using functionalized single wall carbon nanotubes (SWNT) using our interfacial *in situ* polycondensation method. To improve mechanical properties, SWNT were functionalized with specific groups $-(CH_2)_nCOCl$ with n of 4 or 9 to facilitate covalent bonding between the SWNT and the nylon matrix via alkyl segments. After synthesis, the SWNT/nylon 6,10 nanocomposites were melt spun into fibers. Relative to nylon 6,10 prepared in the same manner, the 1wt% SWNT/nylon 6,10 composite shows significant increases in tensile modulus (160%), strength (160%) and toughness (140%) with only modest reduction in the strain to break. The alkyl segments at the SWNT/nylon 6,10 interface appear to be critical to observed improvements.

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