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Polymer composites of aligned carbon nanotubes J. A. FAGAN, J. R. SIMPSON, NIST, B. J. LANDI, RIT, L. J. RICHTER, I. MANDELBAUM, NIST, R. RAFFAELLE, RIT, A. R. HIGHT WALKER, B. J. BAUER, E. K. HOBBIIE, NIST — Model composites of DNA-wrapped single-wall carbon nanotubes (SWNTs) in polyacrylic acid (PAA) are melt-stretched above the glass transition temperature of the PAA to make optically transparent SWNT-PAA films that preserve the optical signature of isolated SWNTs. Optimal nanotube dispersion is confirmed using small-angle neutron scattering (SANS) and near-infrared (NIR) fluorescence spectroscopy. We discuss the factors limiting the dispersion of SWNTs in polymers at the individual nanotube level, and we quantify the degree of SWNT alignment.

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