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Structure and Nanomechanical Properties of Well-aligned Electrospun PS/MWCNT Composite Nanofibers YUAN JI, SHOUREN GE, JASEUNG KOO, BINGQUAN LI, Department of Materials Science, SUNY at Stony Brook, BATYA HERZBERG, TOBY KLEIN, SKA High School for Girls, JONATHAN SOKOLOV, MIRIAM RAFAILOVICH, Department of Materials Science, SUNY at Stony Brook, SKA HIGH SCHOOL FOR GIRLS COLLABORATION — Carboxyl-functionalized multi-wall carbon nanotubes (MWCNT) were incorporated into polystyrene/DMF solutions and electrospun to form PS/MWCNT composite nanofibers. The nanofibers were spun onto a high speed rotator where they became well aligned. Scanning electron microscopy (SEM) and transmission electron microscopy (TEM) were used to investigate the surface morphology and interior structure of the electrospun nanofibers. A three-point bending test, using atomic force microscopy (AFM), was utilized to measure the Young's moduli of the nanofibers as a function of fiber diameter and MWCNT concentration. Shear modulation force microscopy (SMFM) was employed to measure the surface glass transition temperature of the composite nanofiber. The existence of MWCNT enhanced the Young's moduli of fibers and increased the glass transition temperature by nearly 10 degrees. Supported by NSF-MRSEC.

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