Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Electrospinning of semicrystalline polymer fibers YING LIU, Stony Brook University, SHUANG CHEN, CHUNHUA LI, ELAINE DIMASI, Brookhaven National Laboratory, GAD MAROM, The Hebrew University of Jerusalem, MIRIAM RAFAILOVICH — Electrospinning of polymeric fibers has been attracted increased interest in recent years. However, the research for ethylene-vinyl acetate (EVA) and linear polyethylene (PE) is still limited, due to their relatively poor solubility in conventional solvent systems at ambient temperature. In this study, EVA and PE fibers were electrospun with different fiber diameter when the electrospinning solution was kept at a temperature greater than that of the solidification temperature of the polymer solutions. The effects of the fiber physical dimension to its crystallization and mechanical properties were thus detected. The morphology of the fibers was measured by scanning electron microscope (SEM) and atomic force microscope (AFM). The shear modulation force microscopy technique (SMFM) was used to measure the melting point, T_m, which was found to increase with increased fiber diameter and crystallinity. AFM three-point bending test demonstrated that the Young's modulus of the fibers drastically increased as fiber diameter decreased.Grazing-incidence small angle x-ray scattering (GISAX) showed that, compared to the bulk material, the crystallinity of the electrospun fibers had been changed.

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Date submitted: 29 Nov 2008 Electronic form version 1.4