Abstract Submitted
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Transmission Ellipsometry and X-Ray Studies on Shear Induced Order in iPP/CNT Nanocomposites[1] YANIEL CABRERA, Tufts University, GEORGI GEORGIEV, Assumption College, LAUREN WIELGUS, BRET STENGER, ROBERT JUDITH, PEGGY CEBE, Tufts University — Polymer Carbon Nanotube Composites (PCNs) are the largest commercial application of carbon nanotubes (CNT) in the field of nanotechnology. Isotactic Polypropylene (iPP) is one of the best model systems to study in this field because iPP/CNT PCNs can form alpha, beta, and gamma crystallographic phases under a variety of crystallization conditions such as nonisothermal and isothermal melt crystallization, or application of shear. We prepared iPP/CNT nanocomposites from solution, by co- precipitation from a non-solvent. Films were made by compression molding, with 0.01 - 5.0 wt.% CNT. The morphological structure and the orientation of the crystals, and the impact of CNT on the crystallization kinetics, were evaluated using transmission ellipsometry, wide angle X-ray scattering, and differential scanning calorimetry. CNTs increase the nucleation rate for crystal formation. Ability of the CNTs to promote the formation of smectic phases in iPP will be discussed.

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