

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Nanocomposites of Poly(vinylidene fluoride) with Multiwalled Carbon Nanotubes¹ WENWEN HUANG, Tufts University, KYLE EDENZON, LUIS FERNANDEZ, SHABNAM RAZMPOUR, Rochester Institute of Technology, JENNA WOODBURN, Gallaudet University, PEGGY CEBE², Tufts University — We report the preparation and characterization of nanocomposites of poly(vinylidene fluoride) (PVDF) with multiwalled carbon nanotubes (MWCNT) with a wide composition range, from 0.1 % to 5.0 % MWCNT by weight. Effect of uniaxial orientation by zone drawing is discussed and compared with unoriented compression molded films. Room temperature two-dimensional wide angle X-ray scattering and Fourier transform infrared spectroscopy were used for phase identification. Differential scanning calorimetry, dynamic mechanical analysis, and thermogravimetric analysis were used to study the thermal properties. Results indicate that: 1) incorporation of MWCNT in PVDF induces a small portion of beta phase crystal in the PVDF/MWCNT bulk films, while zone drawing causes a significant alpha to beta transition; 2) the thermal stability and mechanical properties are improved when MWCNT concentration increases; 3) The glass transition temperature does not change with MWCNT concentration, but a higher glass transition can be obtained by zone drawing.

¹Research supported by the National Science Foundation, Polymers Program of the Division of Materials Research, through grant DMR 0704056.

²Correspondence author

Wenwen Huang
Tufts University

Date submitted: 22 Nov 2008

Electronic form version 1.4