Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Physical Properties of PC-PMMA Multilayers ARIFUR RAHMAN, ERIC BAER, Case Western Reserve University, ALIN CRISTIAN CHIPARA, ROBERT VAJTAI, PULLICKEL M. AJAYAN, Rice University, JAMES HINTHORNE, IBRAHIM ELAMIN, MIRCEA CHIPARA, The University of Texas Pan American, ERIC BAER COLLABORATION, PULLICKEL AJAYAN COLLABORATION, MIRCEA CHIPARA COLLABORATION — Multilayers of polycarbonate (PC) and polymethylmethacrylate (PMMA) have been obtained by the layer multiplying coextrusion method. Each sample (1024 layers, of equal thickness, with individual thickness between 10 and 200 nm) has been investigated at room temperature by Wide Angle X-Ray Scattering (WAXS) using a Bruker Discovery 8 spectrometer (Cu Kα radiation), Raman spectroscopy (Bruker Senterra confocal Raman spectrometer operating at 785 nm), FTIR spectroscopy (Tensor 27 Bruker), and UV-Vis spectroscopy. Further details about the glass transition temperature in these samples have been obtained by Dynamical Mechanical Analysis, DMA, (TA Instruments Q800) at various frequencies in the range 1 to 100 Hz. Isothermal Differential Scanning Calorimetry, DSC, (TA Instruments Q200) was used to investigate the effect of the thickness of the polymeric film on the crystallization processes. Non-isothermal DSC measurements aimed at the identification and location of the main phase transitions (glass, crystallization, and melting) occurring in these multilayers. The effects of confinement on the phase transitions occurring in these multilayers are discussed in detail.

Mircea Chipara
The University of Texas Pan American

Date submitted: 13 Nov 2014 Electronic form version 1.4