

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Raman, UV-Vis, and Wide Angle X-Ray Scattering Investigations on Polyvinylidene Fluoride – Fe₃O₄ Nanocomposites JERRY CONTRERAS, IBRAHIM ELAMIN, JASON PARSONS, DORINA M. CHIPARA, JAMES HINTHORNE, KAREN LOZANO, MIRCEA CHIPARA, The University of Texas Pan American — Fe₃O₄ nanoparticles of about 75 nm from Nanostructured & Amorphous Materials, Inc. have been dispersed within the polyvinylidene fluoride (PVDF) by melt mixing. Nanocomposites with various weight fraction of nanofiller (0%, 0.2 %, 0.6 %, 1.2%, 2.4 %, 5.8 %, 12 %, 23 %, and 30 %) have been obtained and measured by Wide Angle X-Ray Scattering (WAXS, Bruker Discovery 8 with the Cu K α radiation), Raman spectroscopy (Bruker Senterra confocal Raman microscope operating at 785 nm), and UV-Vis. Raman spectra indicated that alpha PVDF is the main crystalline component of the polymeric matrix and revealed a fast decay of the polymeric lines as the loading with iron oxide is increased. The Raman lines have been successfully fitted by an extended Breit-Wigner Fano lineshape. The effect of the nanofiller on the position, amplitude, and width of Raman lines is analyzed in detail. WAXS investigations confirmed the presence of magnetite. The effect of the loading with nanoparticles on the position, amplitude, and width of WAXS lines of Fe₃O₄ and PVDF are reported.

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Date submitted: 13 Nov 2014

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