

Abstract Submitted
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Raman Investigations of PVDF-BaTiO₃ Nanocomposites JULIO CANTU, Univ of Texas, Rio Grande Valley, CRISTIAN CHIPARA, PULLICKEL AJAYAN, Rice University, JAMES HINTHORNE, MIRCEA CHIPARA, Univ of Texas, Rio Grande Valley — BaTiO₃ nanoparticles (from Nanostructured & Amorphous Materials, Inc.) were dispersed within PVDF powder (from Sigma Aldrich) by melt mixing using a Haake Rheomix with two counter rotating screws. The mixing consisted of 3 segments first at 190 °C and 60 rotations per minute (rpm) for 30 minutes, second at 210 °C and 80 rpm for 15 minutes, and the last at 180 °C and 60 rpm for 30 minutes. Nanocomposites containing various fractions of nanofiller, ranging from 0 to 15 % wt. have been prepared. Raman investigations on the as obtained nanocomposites have been performed by using a Renishaw InVia spectrometer operating at 532 and 785 cm⁻¹. Complementary Wide Angle X-Ray Scattering measurements on the same samples revealed that the as obtained nanocomposites have a dominant beta phase and provided additional information about the size of polymeric crystallites. The effect of the nanofiller on the Raman lines of the PVDF are analyzed in detail. The Raman spectra have been deconvoluted assuming a superposition distorted Lorentzian line shape. The changes of the Raman spectrum parameters (position, amplitude, width, and asymmetry factors) due to the loading with BaTiO₃ is discussed.

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