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Thermal Investigations on PVDF-BaTiO₃ Nanocomposites MIRCEA CHIPARA, DAVID GARZA, DORINA M. CHIPARA, The University of Texas - Pan American, Department of Physics and Geology, ARMANDO SALI-NAS, The University of Texas - Pan American, Department of Mechanical Engineering, STEVEN C. TIDROW, JERRY CONTRERAS, The University of Texas -Pan American, Department of Physics and Geology, DEPARTMENT OF PHYSICS AND GEOLOGY COLLABORATION, DEPARTMENT OF MECHANICAL EN-GINEERING COLLABORATION — Nanocomposites of polyvinylidene fluoride (PVDF) and barium titatanate (BaTiO3) were obtained by melt. BaTiO3 with cubic structure and average size of 100 nm was purchased from Nanostructured & Amorphous Materials, Inc. The mixing consisted of 3 segments at 190 °C and 60 rotations per minute (rpm) for 30 minutes, 210 °C and 80 rpm for 15 minutes, and $180 \,^{\circ}\mathrm{C}$ and 60 rpm for 30 minutes. Nanocomposites loaded with various amounts of BaTiO3 ranging from 0 to 15 % wt. were synthesized. Differential Scanning Calorimetry measurements were performed by using a DSC Q-100 TA Instruments equipment. Isothermal crystallization rates were recorded for 100 minutes in the temperature range 130 °C to 150 °C. Prior crystallization, the samples were annealed at 175 $^{\circ}$ C for 10 minutes. Experimental results were analyzed within the Avrami model including subsequent improvements. The effect of the nanofiller on melting temperature, crystallization temperature, and degree of crystallization was investigated. Wide Angle X-Ray scattering data are also reported. Electron microscopy confirmed the dispersion of BaTiO3 nanoparticles within PVDF.

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