

International Conference on

Polymer Science & Engineering

August 22-24, 2016 New Orleans, USA

MWCNT doped PVDF: Nanocomposite films and their Raman spectral analysis

Padmaja Guggilla

Alabama A&M University, USA

Nanocomposite films are of great interest in the development of infrared detectors and other technology. Polyvinylidene fluoride (PVDF) with excellent pyroelectric and piezoelectric properties such as fast, dynamic response has great potential for use in touch/tactile sensors, infrared detectors and thermal vidicon/imaging devices. PVDF:LiNbO₃, PVDF:LiTaO₃, and PVDF:BaTiO₃ nanocomposites are fabricated with optimal characteristics using the solution casting technique. All these nanocomposite films are doped with multi-walled carbon nanotubes (MWCNT) with various weight percentages. The objective of this research was to characterize the low-frequency dielectric constant, dielectric loss and the pyroelectric properties of these composite films and thus the materials figures of merit for their use in space applications. Nanocomposites are also characterized using Raman Spectroscopy to get the finger print of these materials and their existence in the composite film. Dielectric constant and dielectric loss results are presented as a function of temperature and frequency, and pyroelectric coefficient as a function of temperature. Raman Spectrum of the nanocomposite materials are also presented using two different power and range lasers. Obtained Raman spectrum matches with the literature available. Authors also observed that both microscopic structure and environmental conditions contributed to observed properties. Dielectric loss resulted from electromagnetic energy loss as manifested through phase differences between low-frequency input signal to the films and time varying polarization.

Biography

Padmaja Guggilla has completed her PhD from Alabama A&M University in 2007. She is presently working as Associate Professor of Physics at Alabama A&M University. She has published more than 45 papers in reputed journals and has been serving as an Editorial Board Member of reputed journals. She has secured over 2 million dollars of extramural funds as Principal Investigator in the last five years.

padmaja.guggilla@aamu.edu**Notes:**