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Electron spin resonance on carbon nanotubes-polymer composites MIRCEA CHIPARA, Indiana University Cyclotron Facility, ZALESKI JEFFREY, Indiana University, DAVID HUI, University of New Orleans, NING PAN, UC Davis, MIRCEA CHIPARA COLLABORATION[1], DAVID HUI COLLABORATION[2] — Electron spin resonance (ESR) is used to assess the quality of carbon nanotubes. However, few studies were done on carbon nanotubes dispersed in polymeric matrices. Not annealed carbon nanotubes exhibit three electron spin resonance (ESR) line; a wide resonance line located at g values larger than g=2.0023 assigned to catalyst residues and two lines located close to g=2.0023 assigned to paramagnetic impurities and electrons delocalized over the conducting domains of carbon nanotubes. The annealing process reduces dramatically the intensity of the wide line. Qualitatively, same resonance lines were observed in carbon nanotubes-polymer composites. Samples of polystyrene loaded with various amounts of carbon nanotubes ranging from 0.1% to 10.0% (wt) were prepared. The effect of nanotube dispersion on the parameters of the resonance line is presented. The effect of temperature on the resonance line parameters was investigated. A matrix effect was observed within the glass transition range. This has been assigned to the adhesion of nanotubes to the polymeric matrix.

[1]Preparation and characterization of composites
[2]Mechanical properties of composite

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