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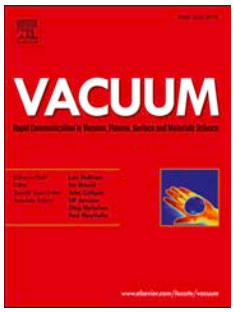

Physico-chemical modification induced in PLGA/OMMT nanocomposite films by Li^{3+} ion beam

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Physico-Chemical Modification Induced in PLGA/OMMT Nanocomposite films by Li^{3+} Ion Beam

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Abstract

The swift heavy ions irradiation (SHI) effects on the optical, structural and morphological properties of poly(lactide-co-glycolide) (PLGA) nanocomposites containing organically modified nanoclay organo-montmorillonite (OMMT) (Cloisite®30B) has been studied over a range of fluences. Optical analysis of the polymer nanocomposites shows that both the cross-linking phenomenon is caused by swift heavy ion irradiation. The absence of peak of nanoclay in all irradiated nanocomposite samples in Fourier transfer Infrared (FTIR) spectrum demonstrates the formation of complete and/or partial exfoliation. The broadening of peak width of X-ray diffraction (XRD) spectra of irradiated nanocomposite implies an increase in the amorphous phase at higher fluences. Field emission scanning electron microscopy (FESEM) shows the formation of porous structure after irradiation. Presence of nanoclay is found to affect the properties of this degradable copolymer when subjected to ionizing radiation.

Keywords: PLGA; Cloisite® 30B; irradiation effects; spectroscopy; Fourier transfer Infrared (FTIR); X-ray diffraction (XRD); Field emission scanning electron microscopy (FESEM); optical properties.

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