NANOPARTICLES OF PHB AND PMMA POLYMERS DOPED WITH $Eu(TTA)_3(TOPO)_2$ AND $Gd(TTA)_3(TOPO)_2$

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Nanoparticles with luminescent properties have potential application in high-resolution devices such as electroluminescent, field emission displays, cathode ray tubes and biology assays. Markers based on polymer materials has attracted noteworthy attention for the reason that materials are expected to become alternatives to conventional inorganic based materials due to their easier handling, low cost and integration over inorganic counterparts. The particles are produced by using chloroform solution of the polymer and ethanol solution of the doping materials and frozen in liquid nitrogen and were successful according to the structural characterization, infrared absorption spectroscopy, and scanning electronic microscopy (SEM). All the experiments were done under similar conditions. Figure. shows the excitation spectra of the PHB and PMMA:10%$Eu(tta)_3(TOPO)$: nanoparticles with emission monitored at $^5D_0 \rightarrow {}^7F_2$ (~616 nm) transitions of the Eu^{3+} ion. It is observed two overlapped absorption bands between 260 and 425 nm, which are assigned to the PMMA, PHB and tta species. It is observed that in the emission spectrum of the particles , under excitation at 394 nm, the $^5D_0 \rightarrow {}^7F_2$ transition (616 nm) originated from the Eu^{3+} ion is the most prominent in the visible range and is responsible for the subsequent red emission of the polymer nanoparticles The PMMA and PHB polymer matrix acts as co-sensitizer and enhances the overall luminescence intensity of the polymer nanoparticles as compared to the complex.

Figure Excitation and emission spectra of PHB and PMMA polymers nanoparticles micrographies of Gd and Eu materials and bulk materials doped with $Eu(TTA)_3(TOPO)_2$ under 360nm UV- lamp.

[1] J. Kai, M.C. F. C. Felinto, L.A. O. Nunes, O. L. Malta, H. F. Brito *Journal of Materials Chemistry*, [2011], [21l], 3796