## Highly luminescent polymer films doped with tetrakis Ln<sup>3+</sup>-β-diketonate complexes

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Polymers doped with lanthanide (Ln) complexes have attracted considerable interest because they preserve the luminescence properties of the complexes while they can be processed from solution and are mechanically flexible [1]. In this work, we report the preparation, characterization and photoluminescence study of polymer films doped with tetrakis-βdiketonate Ln<sup>3+</sup>-complexes. The elemental analysis, infrared spectroscopy, X-ray powder diffraction and thermal analysis confirmed the general formula of (M)[LnL<sub>4</sub>] (where M<sup>+</sup>: lithium, sodium and triethyl ammonium;  $Ln^{3+}$ : europium, gadolinium and terbium;  $L^{-}$ : acetylacetonate, dibenzovlmethanate and trifluorothenovlacetonate) of the complex precursors and their successful incorporation into the polymethylmathacrylate (PMMA) and polyhydroxybutyrate (PHB) polymer matrices. The doped films presented interesting nanostructured superficial morphology under scanning electron microscopy, enabling possible preparation routes to vield nanomaterials. Photoluminescence properties were investigated based on the excitation, emission spectra and photoluminescence decay data obtained for the complexes and polymer films at room temperature. Experimental intensity parameters and the absolute quantum yield are also determined and discussed. In summary, due to their intense luminescence, improved overall photostability and thermal stability, the polymer:tetrakiscomplex films may find application in full-color displays, ultraviolet irradiation sensors, diagnostics and drug delivery. PHB:3%(Et<sub>a</sub>NH)[Eu(tta)<sub>4</sub>]



Figure 1: Photograph (left), SEM (middle) and spectra of PHB:tetrakis-Ln<sup>3+</sup>-complex (right).

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<u>References</u>:

<sup>[1]</sup> J. Kai, M.C.F.C. Felinto, L.A.O. Nunes, O.L. Malta, H.F. Brito, Intermolecular energy transfer and photostability of luminescence-tuneable multicolour PMMA films doped with lanthanide– $\beta$ -diketonate complexes, J. Mater. Chem. 21 (2011) 3796–3802.