Technology and optical characterization of luminophore coordination compounds *Eu(o-MBA)$_3$Phen* and NC *PEPC/Eu(o-MBA)$_3$Phen*.

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Abstract: Were obtained a new nanocomposite (NC) based on poly N-epoxy prolyl carbazol (PEPC) and the coordination compound luminophore *Eu(o-MBA)$_3$Phen*, where *o-MBA* is o- methylbenzoic acid and *Phen* – phenanthroline. Nanocrystals of *Eu(o-MBA)$_3$Phen* with the dimensions ~ 50 nm were uniformly incorporated into the *PEPC* polymer matrix with various concentrations. The absorption spectra of coordination compounds and thin layers of NC *PEPC/Eu(o-MBA)$_3$Phen* revealed 1 intensive absorption bands at 2.02 eV. Photoluminescence (PL) spectra showed an intense red luminescence at 578 – 699 nm, which is assigned to the transitions $^4D_0 \rightarrow {}^7F_i$ (i= 0,1,2 3 4) in the *4f*-shell of the Eu^{3+} ion.

1. INTODUCTION

The Europium ions have 4f shell electrons that are shielded by the outer s and p closed shells [1, 2], and they usually prevent any interactions with the environment. Therefore optical transitions into 4f are characterized by atomic-like absorption and emission lines. On the other hand the 4f electronic configuration is affected by the ligand neighbors, because of the larger extent of the wave function. These properties determine the optical transitions and are characterized by sharp absorption and luminescence bands that lead to a variety of interesting optical properties [3] which are used as base in different commercial applications. Recently a great effort is devoted to the development of new materials on Europium base and to the investigation of physical phenomena. A great attention is paid to studying the structure and luminescent properties of Europium organic compounds containing neutral ligands. The Europium usually is incorporated in compounds as trivalent cation and is used for the preparation of optically active materials for photonic and optoelectronic applications [4].

For this it is desirable to obtain the compounds on the basis of Europium with the atomic-like 4f to 4f optical transitions with long lifetime, sharp absorption lines, coherence properties of luminescence, large oscillator strength, broad absorption bands, fast response time are desirable [5].

Now it has been approved that the second ligand plays an important role in europium complexes, the synergistic complexation of the second ligand can not only lead to the construction of efficiently emitting Europium(III) complexes but also improve the volatility and electron- transporting ability of

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