Nanocomposites and nanomaterials

Synthesis, characterization and luminescent properties of polymer bimetallic complexes with -diketone

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Due to their excellent photoluminescence properties (long excited state lifetime, narrow emission bands, and high quantum yields), lanthanide complexes have attracted increasing attention for a broad range of applications such as light emitting diodes, lasers, luminescent probes [1–2]. Electroluminescent lanthanide complexes have the advantages of extremely narrow emission spectra and the possibility of high electroluminescent efficiency caused by the intramolecular energy transfer that consists of the absorption of energy by organic ligands, intersystem crossing into a triplet state of the organic ligands, and energy transfer to the central lanthanide cation.

Polymers of bimetallic complexes with allyl-3-oxo-butanoate (allyl) were synthesized by free-radical polymerization in DMF at the first time.

$$Me^{2+} + Ln^{3+} + 5Na\ allyl = Me(allyl)_2Ln(allyl)_3 + 5Na^+$$

Me= Cu, Co, Ni
Ln = Nd, Er, Yb

Similarity of electronic absorption and diffuse reflectance spectroscopy show a similar structure of the complexes in solution and polycrystalline state. The maximum transitions indicate that copper ions are surrounded by plane-square environment, while for nickel and cobalt ion characteristic octahedral environment.

The method of dynamic light scattering and the results of electronic microscopy showed that the obtained polymer systems are nanoscale.

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2. *Lu Yu-guang, Gong Zhong-ping, Gao Hong-bing, Zhou Shu-jing, Lu Kui-lin, Wang Ying, A Du, Du Hao-ran, Zhang Li, and Zhang Fu-jun.* Synthesis and luminescent properties of ternary complex $Eu(UVA)_3Phen$ in nano-TiO_2. // Optoelectronics Letters. - 2015. - **11,** No.1. - P. 0041-0044