

Synthesis and Characterization of Luminescent Europium(III) Complex for Fabrication of Photoluminescent Devices

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Abstract—An aromatic carboxylic acid, 2-[4-(dibutylamino)-2-hydroxybenzoyl] benzoic acid (DAHB) and neocuproine ligands were used to prepare europium(III) complex $\text{Eu}(\text{DAHB})_3\text{.neo}$. The $\text{Eu}(\text{DAHB})_3\text{.neo}$ (neo = neocuproine) complex was synthesized by solution precipitation method and characterized by means of elemental analysis, $^1\text{H-NMR}$, IR, UV-visible, photoluminescence (PL) spectroscopy and thermo gravimetric analysis. The spectroscopic studies confirm the bonding of ligand with europium ion through carboxylate group. In emission spectra of europium(III) complex, the intense and hypersensitive $^5\text{D}_0 \rightarrow ^7\text{F}_2$ transition is observed at 615 nm (1). The time decay curve of complex clearly reveals the presence of single luminescent centre. The CIE color coordinates of complex are close to National Television committee system (NTCS 1987) primary color (0.63, 0.34). The TG-DTG curve of complex exhibits high thermal stability. The excellent luminescence performance of the complex makes it promising candidate for low voltage driven photoluminescent devices (2).

Reference

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