

PHOTOLUMINESCENT STUDIES OF THE EUROPIUM(III) - THENOYLTRIFLUOROACETONATE COMPLEXES WITH DIFFERENT LACTAM

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In this work we report the preparation, analytical and thermal characterization of europium(III)-thenoyltrifluoroacetate complexes with different lactams (cyclic amides), with stoichiometric formula of $[\text{Eu}(\text{TTA})_3(\text{Lactam})(\text{H}_2\text{O})]$, where Lactam are: 2-Pyrrolidone; 2-piperidone; ϵ -Caprolactam and Oenantholactam (Figure 1). The optical properties were investigated and the emission spectrum recorded in the range of 530–720 nm at 298 K, under excitation at 370 nm. It presents narrow emission bands from the $^5D_0 \rightarrow ^7F_J$ transitions (where $J = 0-4$) dominated by the hypersensitive $^5D_0 \rightarrow ^7F_2$ transition around 615 nm. The experimental intensity parameters values of Ω_2 and Ω_4 for the complex were calculated based on the $^5D_0 \rightarrow ^7F_1$ emission is almost insensitive to changes in the chemical environment, and primarily magnetic dipole by character, while the $^5D_0 \rightarrow ^7F_2$ emission is essentially forced electric dipole in character. The intensity parameter Ω_2 is the most influenced by small angular changes in the local geometry. This effect together with changes in ligating atom polarizability (α) has been used to rationalize the hypersensitivity of certain $4f-4f$ transitions to changes in the chemical environment.

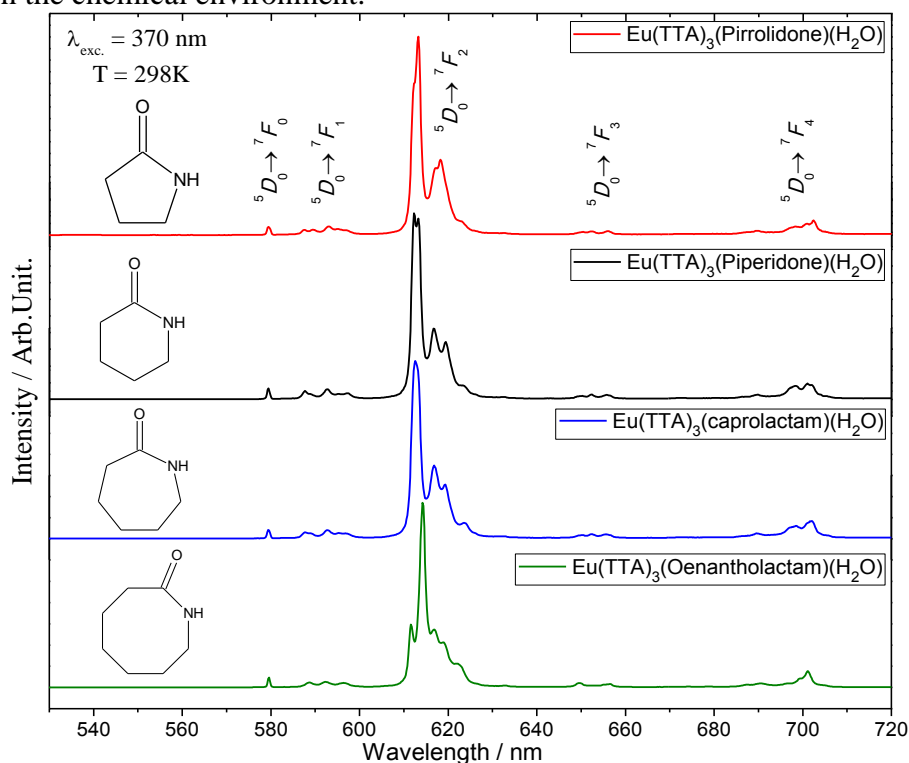


Figure 1- Emission spectra of complexes at 298K recorded from 530 to 720 nm under excitation at 370 nm.