Luminescence of Eu(tta)$_3$(*N*-picNO)$_2$ (*N*=2, 3 and 4) doped PMMA films under Synchrotron radiation.

L. H. C. Francisco,[1] R. P. Moreira,[1] H. F. Brito[2], E. E. S Teotonio[3], O. L. Malta[4] and M. C. F. C. Felinto[1]*

[1] *Nuclear and Energy Research Institute, São Paulo - SP, 05508-000, Brazil.*
[2] *Institute of Chemistry, University of Sao Paulo, São Paulo - SP, 05508-900, Brazil.*
[3] *Department of Chemistry, Federal University of Paraíba, João Pessoa - PB, 58033-455, Brazil.*
[4] *Department of Fundamental Chemistry, Federal University of Pernambuco, Recife - PE, 50740-560, Brazil.*

**E-mail: mfelinto@ipen.br*

Since their discovery, trivalent lanthanide β-diketonate complexes often stand out among luminescent coordination compounds [1]. Thus, the incorporation of such complexes into polymeric materials proposes increased photostability, optical quality, and processing conditions [2]. In this work, we prepared and doped the luminescent Eu(tta)$_3$(*N*-picNO)$_2$ (*N*=2, 3 and 4) complexes into Poly(methyl methacrylate) (PMMA) films *via* the solvent casting method, yielding transparent materials under visible light. These amorphous materials (XRD) presented considerable thermal stability up to 300°C (TGA), and their spectroscopic properties with ancillary ligand exchange were investigated by luminescence spectroscopy in the UV-Vis and Vacuum-UV energy range by synchrotron radiation. Mainly, Eu^{3+} transitions ($^5D_0 \rightarrow {}^7F_{0\text{-}4}$) were observed in the emission spectra for all compounds, with intense monochromatic-like red (614 nm) emission (**Fig. 1**), indicating efficient intramolecular energy transfer. Experimental intensity parameters and quantum yields were also determined, where it is seen the influence on the positioning of the methyl group in the luminescence efficiency

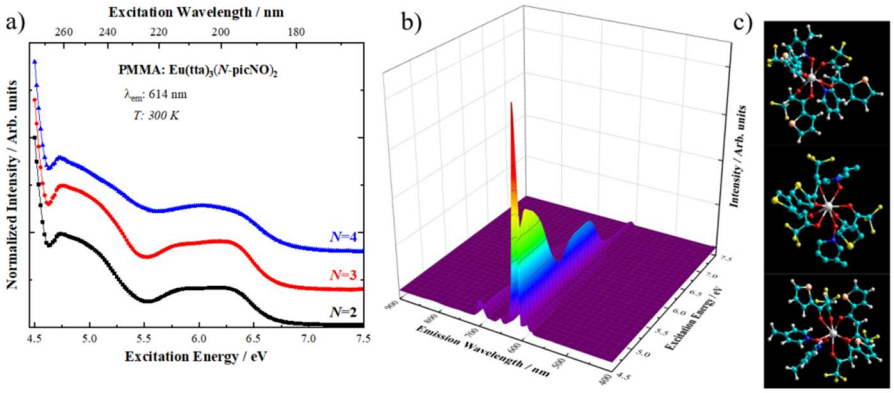

Fig. 1: a) Total absorption of PMMA:Eu(tta)$_3$(*N*-picNO)$_2$ compounds and b) 3D luminescence spectra of PMMA:Eu(tta)$_3$(*2*-picNO)$_2$ under Vacuum Ultraviolet excitation. c) Molecular structures of Eu(tta)$_3$(*N*-picNO)$_2$ complexes, where *N*=2, 3 and 4 from top to bottom, respectivelly.

References

[1] H. F. Brito, et al., *The Chemistry of Metal Enolates*, 131-184 (2009).
[2] L. H. C. Francisco, et al. *J. Mater. Sci. Mater. Electron.* **30**, 16922–16931 (2019).