

## **POLYPROPYLENE LUMINESCENCE BEHAVIOR THROUGH STABLE POLYMERIC OPTICAL MARKER**

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### **ABSTRACT**

Researches and publications about luminescent polymers have been developed in the last years due the academic innovation<sup>1</sup>; however the application is very limited at industrial area. Optical markers processed are few explored due the difficult to process this kind of luminescent materials. The materials used to obtain luminescent polymeric material doped with europium complex was [Eu(tta)<sub>3</sub>(H<sub>2</sub>O)<sub>2</sub>]. Polyolefin are inert and do not adapt in a common process of dope, because of this, luminescent polypropylene was indirectly prepared by polymeric matrix doped with europium complex through extrusion process. Product characterization was done using Thermal gravimetric analysis (TG), Differential Scanning Calorimetric (DSC), X-Ray Diffraction (XRD), Infrared spectroscopy (FTIR) and spectrofluorescence of emission and excitation. The blend optical marker Pol:Eu(tta)<sub>3</sub> presented luminescent properties as observed in the narrow bands of intraconfiguration transitions– 4f<sup>6</sup> relatives to energy levels <sup>7</sup>F<sub>0</sub> → <sup>5</sup>L<sub>6</sub> (394nm), <sup>7</sup>F<sub>0</sub> → <sup>5</sup>D<sub>3</sub> (415nm), <sup>7</sup>F<sub>0</sub> → <sup>5</sup>D<sub>2</sub> (464nm), <sup>7</sup>F<sub>0</sub> → <sup>5</sup>D<sub>1</sub> (525nm) e <sup>7</sup>F<sub>0</sub> → <sup>5</sup>D<sub>0</sub> (578nm) of emission spectrum. Red light of the pellets or films is emitted when the materials are exposed in UV lamp (365nm). In this work was possible to process luminescent polymeric:Eu optical marker with properties of thermal and photo stability<sup>2</sup> which can be used as optical marker in extrusion process.

**Keywords:** *luminescent polymers; trivalent rare earth; extrusion double-screw; polymer matrix*

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### **References**

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