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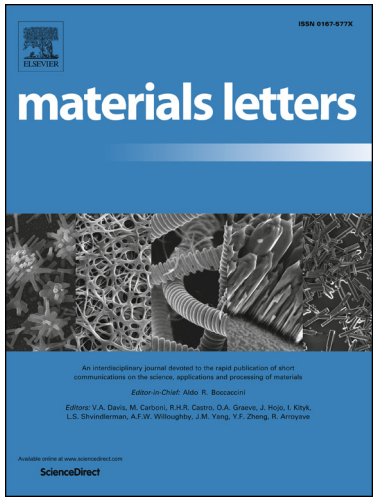

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Melt Spinning Fibers of Isotactic Polyproplene Doped with Long-Lifetime Luminescent Inorganic-Organic SiO_2-Eu^{3+} Hybrid Nanoparticles

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Abstract: Novel Stöber derived silica nanoparticles doped with europium complexes [$Eu(tta)_3$phen]by two-step alkaline hydrolysis method have been fabricated in order to design stable luminescent hybrid nanoparticles with fine particle size. Isotactic polypropylene (iPP) was doped with long-lifetime (τ=859.2μs) luminescent nanoparticles via twin screw extrusion. The composition, structure and luminescence properties of the resulting hybrid nanoparticles were investigated in detail. STEM revealed that europium complexes were encapsulated homogenously and stably in nano silica. The luminescence measurements combined with bright red color photographs confirm the red light emission due to trivalent europium ions, while the intensity increases with the increase of corresponding doped concentrations of SiO_2-Eu^{3+} nanoparticles in iPP hybrid materials. The melt processable luminescent optical fibers reported here is a novel application of rare earth complexes that can be used to develop new photonic and electronic materials.

Key words: Europium complexes; Luminescence; Nanoparticles; Lifetime; Isotactic PP.

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