Accepted Manuscript

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PII: S0030-4026(17)30812-4

DOI: http://dx.doi.org/doi:10.1016/j.ijleo.2017.07.003

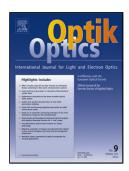
Reference: IJLEO 59398

To appear in:

Received date: 25-1-2017 Accepted date: 3-7-2017

Please cite this article as: N.P.Bhagya, P.A.Prashanth, R.Hari krishna, B.M.Nagabhushana, R.S.Raveendra, Photoluminescence studies of Eu3+ activated SrTiO3 nanophosphor prepared by solution combustion approach, Optik - International Journal for Light and Electron Opticshttp://dx.doi.org/10.1016/j.ijleo.2017.07.003

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Photoluminescence studies of Eu³⁺ activated SrTiO₃ nanophosphor prepared by solution combustion approach

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ABSTRACT

Orange-red emitting europium doped (1-9 mol %) SrTiO₃ (ST) nanophosphor was synthesized by solution combustion method using urea as a fuel. The crystallinity and phase formation of the nanophosphor was studied by powder X-ray diffraction (PXRD). The Field- emission scanning electron microscopy (FE-SEM) images are evident for the porous and agglomeration nature for the product. The Fourier transform infrared spectroscopy (FT-IR) indicates the formation of the oxide bonds. The photoluminescence (PL) of SrTiO₃:Eu³⁺ phosphor with different mol % of Eu³⁺ excited by 395 nm light was studied. The photoluminescence spectra exhibit characteristic luminescence from $^5D_0 \rightarrow ^7F_{1, 2, 3}$ intra-4f shell Eu³⁺ ion transitions. An intense orange red emission peak at 615 nm was observed due to electric dipole ($^5D_0 \rightarrow ^7F_2$) transition. The color purity of the phosphor was confirmed by CIE co-ordinates. The study demonstrates a simple and efficient method for the synthesis of novel nanophosphor with enhanced orange-red emission.

Keywords: nanophosphor; combustion method; photoluminescence; emission intensity; excitation intensity

1. Introduction.

From the past few decades the nanocrystalline phosphors have gained more attention due to their wide applications in optoelectronic devices [1]. The most of the phosphor consists of host

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