Wet Chemically Synthesized Optical Investigation of Tb^{3+}/Eu^{3+} Activated/co-Activated $BaTiO_3$ Phosphors by Energy Transfer Mechanism

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Abstract

In last few years rare earth activated inorganic phosphors comes into trend in the field of display devices. In the proposed research article, Tb^{3+}, Eu^{3+} activated/co-activated $BaTiO_3$ phosphor prepared by wet chemical method. Through the use of XRD and Rietveld refinement, the phase identity and crystal structure of produced phosphor are examined. SEM is used to examine the morphological analysis and elemental analysis of the suggested phosphor in conjunction with elemental analysis of the sample. In photoluminescence spectra (PL), Under 265 nm, 395 nm and 465 nm excitation, the synthesized Tb^{3+}, Eu^{3+} activated/co-activated $BaTiO_3$ phosphors exhibited an orange emission peak located 595 nm and a red emission peak located 614 nm due to the $^5D_0 \rightarrow {}^7F_1$ and $^5D_0 \rightarrow {}^7F_2$ transitions of Eu^{3+} ions while doping of Tb^{3+} ions gives emission in green region. On satisfying the spectral overlap criteria, the codoping of both the rare earth ions is done in the host matrix and resultant PL shows that the sample shows color tunability from green to red region. These all results confirm that the prepared phosphor is potential candidate for WLEDs and display applications.

Keywords

Wet chemical, lamp phosphor, LEDs, color tunability, energy transfer.