Effect of Eu3+ Concentration on the Luminescent Properties of SrTiO3 Phosphors Prepared by Pressure-Assisted Combustion Synthesis

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Abstract

This work presents the structural, morphological, and luminescent characterization of pure SrTiO3 and SrTiO3:Eu3+ powders doped with different europium atomic concentrations from 3.0 to 7.0 a.t.%. Those phosphors were prepared by pressure-assisted combustion synthesis using titanium oxide as precursor and were subjected to postannealing at 1200°C. XRD measurements indicated that undoped and Eu3+ doped samples presented a single cubic crystalline phase and SEM images demonstrated that we have particles with sizes in the range of 0.2 μm–1.0 μm. Moreover, the size of the grains increases as the content of Eu3+ dopant increases. A strong red emission from Eu3+ ions was obtained by photoluminescence under excitation at 396 nm and confirmed by cathodoluminescence. All those results indicate that our red phosphors could be useful for potential applications in solid state lighting and field emission displays.