

Carbohydrazide assisted combustion synthesis and photoluminescent properties of $\text{Sr}_2\text{V}_2\text{O}_7:\text{Eu}$ Nanophosphor

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Abstract

Recently combustion synthesis has emerged as an attractive technique for the synthesis of high purity, crystalline, homogeneous oxide powders at low temperature. Eu^{3+} doped $\text{Sr}_2\text{V}_2\text{O}_7$ nanophosphor material has been prepared by combustion synthesis process using carbohydrazide as a fuel. Morphology and luminescent properties of $\text{Sr}_{2(1-x)}\text{V}_2\text{O}_7:2x\text{Eu}^{3+}$ nanophosphor material were characterized by scanning electron microscopy (SEM), X-ray diffractometry (XRD), fluorescence spectrometry and Fourier transform infra-red spectroscopy etc. The incorporation of Eu^{3+} activator in these materials has been checked by luminescence characteristics. The prepared nanophosphor material under UV source displays red luminescence. The emission spectra indicated the excellent red photoluminescent properties of $\text{Sr}_2\text{V}_2\text{O}_7:\text{Eu}^{3+}$ nanophosphor due to characteristics transition of Eu^{3+} ions from $^5\text{D}_0 \rightarrow ^7\text{F}_2$ transition at 616 nm. The dependence of the luminescence intensity on Eu^{3+} ions concentrations and effect of heat treatment have also been discussed.

Keywords: $\text{Sr}_2\text{V}_2\text{O}_7:\text{Eu}^{3+}$, Carbohydrazide, Europium, Luminescence.