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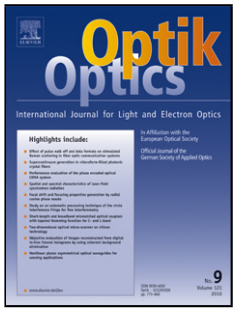

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Luminescence and ESR study of Gd^{3+} doped $Ca_3Al_2O_6$ phosphor

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Abstract

Gd^{3+}-doped $Ca_3Al_2O_6$ (CA3) phosphor was synthesized using a combustion method. The crystal structure and the phase purity of the sample were characterized by X-ray powder diffraction (XRD). The surface morphology of the sample was studied using a scanning electronic microscope (SEM). The Gd^{3+}-doped $Ca_3Al_2O_6$ phosphor showed an absorption band in the UV spectral region and a narrowband-UVB emission under the excitation of 273 nm. The narrowband-UVB emission at 314 nm corresponds to the $^6P_{7/2} \rightarrow {}^8S_{7/2}$ transition of the Gd^{3+}. A dominant line in the region around g = 2.0 was observed in the electron spin resonance (ESR) spectrum of the prepared phosphor.

Keywords: Combustion; ESR; Gd^{3+}; $Ca_3Al_2O_6$; Phosphor; Luminescence