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Synthesis and Characterization of $\text{CaB}_x\text{O}_y:\text{Eu}^{3+}$ nano-phosphors prepared using Solution - Combustion Method

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Abstract content
 (Max 300 words)

Calcium borate ($\text{CaB}_x\text{O}_y:\text{Eu}^{3+}$) phosphors with different Ca:B molar ratio and holding Eu concentration constant have been synthesized by a solution combustion method at reaction temperatures of 5000C for 15 minutes. The morphology, structure and luminescence properties of the synthesized nanostructures were investigated using X-ray diffraction (XRD), Scanning Electron Microscopy (SEM) and Photoluminescence (PL) spectroscopy. The XRD spectra of all the as prepared samples show an amorphous phase. SEM micrograph show that the surface aspect are nanorod like for Ca:B mole ratios but the grains become flake-like as the Ca:B molar ratio increased, giving rise to the increase in particle size resulting from agglomeration. PL results analysis showed that as the excitation wavelength increases the luminescence intensity also increases. The maximum luminescence intensity was found to be maximum at an excitation wavelength of 395 nm. The PL results also shows that the luminescence intensity of these emission spectra increased with the addition of more Ca:B molar ratio. The narrow emissions between 590-688 nm are due to transitions Eu^{3+} .

Keywords: $\text{CaB}_4\text{O}_7:\text{Eu}^{3+}$, Nano-phosphors, Solution-Combustion

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