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A new white light emitting phosphor

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Abstract content
 (Max 300 words)

The objective of this study was to prepare a new aluminates host for rare-earth ions and evaluate it for application in white lighting. $\text{CaAl}_2\text{O}_4\text{:Tb}^{3+}\text{Eu}^{3+}$ nanocrystalline phosphors with good crystallinity were successfully synthesized by a combustion method using urea as fuel and metal nitrates as precursors at a relatively low temperature of 500°C . The XRD diffraction patterns showed single monoclinic phase of the CaAl_2O_4 as referenced to standard JCPDS data files No. 70-134. As confirmed from the scanning electron microscopy (SEM) images, the characteristic platelet-like particles of the combustion method were formed. The diffusion reflectance spectra were recorded from 800-200 nm by using a UV-Vis spectrometer. Photoluminescence (PL) spectroscopy, excitation and emission spectra of $\text{CaAl}_2\text{O}_4\text{:Tb}^{3+}\text{Eu}^{3+}$ were also recorded. A simultaneous emission of blue, green and red PL was observed from $\text{CaAl}_2\text{O}_4\text{:Tb}^{3+}\text{Eu}^{3+}$ phosphor that was excited at 230 nm. The blue and green emissions were respectively attributed to $^5\text{D}_3 \rightarrow ^6\text{F}_J (J=0-6)$ and $^5\text{D}_4 \rightarrow ^7\text{F}_J (J=0-6)$ transitions of Tb^{3+} while the red emission was attributed to $^5\text{D}_0 \rightarrow ^7\text{F}_J (J=0-4)$ transitions of Eu^{3+} .

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