Contribution ID: **18** Type: **Poster Presentation**

Synthesis and Characterization of BaB₈BO₁₃: Eu nanophosphors Prepared Using Solution-Combustion Method

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Abstract content
   (Max 300 words)

The red emitting BaB₈O₁₃: Eu⁺³ phosphors were synthesized by solution-combustion process, and their luminescent properties were studied under 250 and 325 nm excitation. The excitation spectrum showed two broad bands in the range of 200-400 nm: one was the host lattice absorption with the maxima at 320 nm and the other was Ba-O absorption overlapped with the CT band of Eu⁺³, which indicated that the energy of the host lattice absorption could be efficiently transferred to the Eu⁺³. The overlapped bands were tended to separate when monitored by different wavelength, which indicated that at least two Ba⁺² sites were available in BaB₈O₁₃. The emission spectra peaks at 592, 615, 656 and 690 nm are assigned to 5 D0 ⟶ 7Fj (J= 1, 2, 3 and 4) transitions of Eu⁺³ ions namely the 5D0 ⟶7F1 (592 nm), 5D0 ⟶7F2 (615 nm), 5D0 ⟶7F4 (656 nm), and 5D0 ⟶7F4 (694 nm), respectively. The Ba:B mole ratio hardly changes the luminescence property of the material while the Eu moles affect significantly up to an optimum concentrations. There after the cross relation process occurs due to concentration quenching. SEM micrographs of the BaB_xO_y: Eu⁺² phosphors at low magnification show agglomerates and high magnification depicts that particle with sizes in nano ranges are the primary sources of agglomerates. XRD patterns analysis confirms the existence of pure BaB₈O₁₃ phase (JCPDS: 74-0674) for all molar rations of barium to borate. The variation of Eu concentrations content was found to have no effects on the crystal structure.

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yes

Level for award
 (Hons, MSc,
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MSc

Main supervisor (name and email)
and his / her institution

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