Contribution ID: **270** Type: **Poster Presentation**

Synthesis and photoluminescence studies of (Ba_{1-x}Sr_x)Al₂O₄:Eu<sup>2 prepared by combustion method

Wednesday, 13 July 2011 17:00 (2 hours)

<p>Barium-substituted phosphor powders of (Ba_{1-x}Sr_x)Al₂O₄:Eu<sup>

2+</sup> ;Nd³⁺ composition were prepared by combustion method at an initiating temperature of 500⁰C, using urea as reducer. The powders were then annealed at higher temperatures of 800⁰C and 1000⁰C for 3 hours. Their crystallinity and phase were characterized by x-ray diffraction (XRD). The x-ray diffraction shows that the crystallinity of (Ba_{1-x}Sr_x)Al₂O<sub>4 at (x=0) greatly improved after annealing at the higher temperature of 1000⁰C and shows the hexagonal structure that closely correspond with the JCPDS data (PDF17-0306). The morphology of the (Ba_{1-x}Sr_x)Al₂O₄:Eu²⁺;Nd³⁺ composition were investigated using Scanning Electron Microscopy (SEM). The effect of varying the Ba/Sr concentration on the thermoluminescence (TL) glow curves was investigated using the Thermoluminescence Reader (Integral-Pc Based) Nucleonix TL 1009I. Photoluminescence (PL) properties of all phosphor samples were investigated by measuring their emission spectra using a 325nm He-Cd laser. For the as-prepared phosphor samples, the sample with x=0 (BaAl₂O₄:Eu²⁺;Nd³⁺showed a much higher intensity compared to both the sample with x=1 (SrAl₂O₄:Eu²⁺;Nd³⁺an the mixed composition of the two. (BaAl₂O₄:Eu²⁺;Nd³⁺(x=0) and SrAl₂O₄:Eu²⁺;Nd³⁺ (x=1)showed a broad emission at 505nm and 522nm respectively while the mixed composition showed two peaks at 447nm and 517nm. The broad emission peaks attributed to 4f⁶5d¹-4f ⁷ transitions of Eu²⁺ were obtained. Their phosphorescence was investigated by using the fluorescence Cary eclipse spectrophotometer coupled with a xenon lamp. Phosphorescence show higher luminescence for (Ba_{1-x}Sr_x)Al₂O₄ (x=0).

Level (Hons, MSc,
   PhD, other)?

MSc

Consider for a student
   award (Yes / No)?

Yes

Would you like to <br> submit a short paper <br> for the Conference
 Proceedings (Yes / No)?

Yes

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