



Contribution ID: 193

Type: **Poster Presentation**

Synthesis and characterization of green $\text{SrAl}_2\text{O}_4:\text{Tb}^{3+}$ phosphor using solution combustion method

Tuesday, 10 July 2012 17:30 (2 hours)

Abstract content **
 **(Max 300 words)

$\text{SrAl}_2\text{O}_4:\text{Tb}^{3+}$ phosphors doped with different concentration of Tb were synthesized by solution combustion method. The crystalline structure, morphology and luminescent properties of the phosphors were studied by X-ray diffraction (XRD), scanning electron microscope (SEM) techniques and photoluminescence (PL) spectroscopy respectively. The XRD analysis reveal polycrystalline monoclinic structure and the calculated average particle sizes ranged between 80 and 90 nm. SEM images show non uniform and irregular shapes of the particles. The Tb^{3+} doped SrAl_2O_4 phosphor shows a green emission when illuminated by 229 nm. The emission spectra show the weak blue emission in the region of 415–459 nm and strong green emission in 489–622 nm. The $4f-4f$ emission from $5D_4$ to $7F_J$ ($J=6, 5, 4, 3$) states of Tb^{3+} are found at 489, 543, 585 and 622 nm, respectively. Other emission peaks from the $5D_3$ to $7F_J$ ($J=5, 4, \text{ and } 3$) transitions were also found at 415, 436, and 459nm. The decay curves of $\text{SrAl}_2\text{O}_4:\text{Tb}^{3+}$ phosphor showed the rapid decay and long afterglow. Intensity of the phosphorescent decreases as the concentration of terbium ions increased in host lattice.

Apply to be **
 consider for a student
 **award (Yes / No)?

Yes

Level for award **
 **(Hons, MSc, **
 **PhD)?

Msc

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

Dejene BF (dejenebf@qwa.ufs.ac.za) University of the Free State

Would you like to **
 submit a short paper
 for the Conference
 Pro- ceedings (Yes / No)?**

Yes

Primary author: Ms FOKA, Kewele Emily (University of the Fee Stae)

Co-author: Prof. SWART, Hendrick (Co-Supervisor)

Presenter: Ms FOKA, Kewele Emily (University of the Fee Stae)

Session Classification: Poster Session

Track Classification: Track A - Division for Condensed Matter Physics and Materials