Contribution ID: **88** Type: **Poster Presentation**

Synthesis and Characterization of white light emitting Sr₂SiO₄:Tb³⁺,Eu<sup>3+</su phosphor

Tuesday, 9 July 2013 17:40 (1 hour)

Abstract content
   (Max 300 words)

In recent years, the study on white light phosphors suitable for ultraviolet (UV) excitation has been attracting more attention for use in white light emitting diodes (LEDs). In white light LEDs, white light can be generated by combination of light of three primary colors (red, green and blue) emitted from different LED chips¹ or combination of blue LED with yellow-emitting phosphor materials^{2,3}. It is important to find a phosphor that can be excited under near-ultra-violet and the blue region³. In recent studies it has been established that white light can be generated by doping one or more activator(s) in one matrix. For example, in this study white photoluminescence was generated when Sr₂SiO₄ co-doped with Tb³⁺ and Eu³⁺ was excited at 227 nm using a monochromatized xenon lamp. The calculated Commission Internationale de l'Eclairage (CIE) chromatic coordinates of the generated white light were (x=0.340, y=0.375), which are very close to those of standard white colour (x=0.333, y=0.333). The X-ray diffraction spectra indicated that the Sr₂SiO₄:Tb³⁺,Eu³⁺ phosphor material was successfully prepared at 1000 [°]C using the solid state method. Scanning electron microscopy images showed agglomeration of particles with irregular shapes. The decay characteristics showed that the phosphor consists of a single exponential decay curve.

References

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Session Classification: Poster1

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