

Di-band and tri-band phosphor blends for near UV and blue LED converted white light emitting diodes

M.Kottaisamy ^{1*}, P.Thiyagarajan ^{1,2} and M.S.Ramachandra Rao ^{1,2}

¹Material Science Research Center, IITM, Chennai

²Dept of physics, IITM, Chennai

*mmksamy66@yahoo.com

Abstract

Phosphor which emits in blue, green and red at the excitation of near UV and blue region were developed and tested for white light generation to yield LED lamps with high colour rendering indexes. In both the cases, the phosphors are excited primarily by the near UV and blue light produced through GaN based LED chips. Two different kinds of blends are developed. One is based on a two color phosphor (dichromatic -blue & yellow emission) system, while the other is based on a three color phosphor (trichromatic- blue, green and yellow) system. Generally mixing of phosphors which emit at blue and yellow or blue-green and red are known to generate white light. More particularly, this invention relates to phosphor blends that convert electromagnetic radiation emitted by near-UV/blue light-emitting devices to white light. This invention also relates to light sources using such phosphor blends. The PL excitation and emission spectra are measured for these compositions and it has been found that these phosphor combinations are easily excitable at near UV to blue region and emit white light which covers from 430 nm to 650 nm. The color co-ordinates confirm white light emission which depends significantly on the composition of the phosphor blend. Phosphor blends are very practical for white light generation with various color shades depending on the composition and excitation, when coupled to a UV, near UV and blue light-emitting LEDs. Results will be presented and discussed.

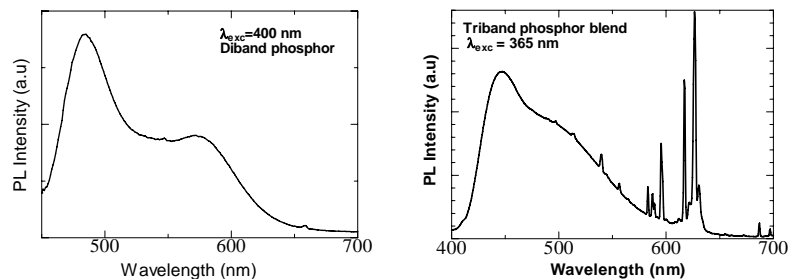


Figure1. PL emission spectra of di band phosphor and tri-band phosphor blends at the excitation of 400 and 365 nms, respectively