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Highly efficient single host white emitting $Sr_{2.91}V_2O_8:Eu_{0.06}$ nanophosphor for UV-LED

K.N. Shinde

N.S. Science and Arts College, India

Abstract

Solid state lighting is the ultimate solution for the replacement of conventional incandescent and fluorescent lamps so it is called as next generation lighting. Now a day, White LEDs manufactured using an n-UVLED coupled with a blend of yellow-and blue-emitting phosphors. A novel white emitting $Sr_{2.91}V_2O_8:Eu_{0.06}$ nanophosphor was successfully prepared via solution combustion method with aspartic acid as a fuel. Its excitation wavelength ranging from 250 to 430 nm fits well with the characteristic emission of UV light-emitting diode (LED). The excitation and emission spectra indicate that these phosphors can be effectively excited by the near-UV light, and emit blue to red light (visible range). Moreover, the present nanophosphor exhibited an excellent color-rendering index when annealed at 950^0C temperature. The $Sr_{2.91}V_2O_8:Eu_{0.06}$ nanophosphor thus shows excellent emission characteristics under a UV excitation and had a uniform particle size distribution which is favorable for high performance LED. The obtained material was found particle size in few nanometer ranges. The maximum emitting peak centered at about 513 nm when $Sr_{2.91}V_2O_8:Eu_{0.06}$ phosphor excited by 330 nm. All the similar broadband emission observed which covers nearly the whole visible light region from 400 nm to 700 nm. The emission intensity increased with increasing temperature and reaches high at 950^0C. These results indicate that the synthesized nanophosphor may be strong candidate for single host white light emitting phosphor for white LEDs.

Biography

K.N. Shinde has completed his Ph. D. at the age of 30 years from R.T.M. Nagpur University, Nagpur, India and postdoctoral studies from Nanotechnology and Advanced Materials Engineering, Sejong University, Seoul, South Korea. At present, He is the director of R & D at N.S. Science and Arts college, Bhadrawati, India. He has published more than 30 papers in reputed journals and serving as an editorial/reviewer of international journals. His research interests are synthesis of nanocrystalline materials and exploring novel materials and study their PL and TL properties. Recently he published a book on “Phosphate Phosphors for Solid State Lighting” with International Publication Springer series in material science.