Impact of Different Temperatures On Vanadate Based Nanophosphor

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Abstract:

From the literature it is said that, the vanadate compounds are chemically and thermally stable. Due to this property vanadate based phosphors are used for various applications. The suitability of M3-3x/2(VO4)2:xEu (0.01≤x≤0.09 for M=Ca and 0≤x≤0.3 for M=Sr,Ba) phosphors doped with europium ions using solution combustion method for phosphor WLED by the measurement of their photoluminescence (PL) and structural properties at different annealing temperature. The main attractive features of SCS are is very simple, safe, cost-effective, having ability to produce materials with high purity, better homogeneity, it is energy and time saving. Therefore here we are reporting synthesis and results of M3-3x/2(VO4)2:xEu (0.01≤x≤0.09 for M=Ca and 0≤x≤0.3 for M=Sr,Ba) phosphors prepared by solution combustion method. 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 phosphor exhibited an excellent color-rendering index when annealed at 9500C temperature. The phosphor thus shows excellent emission characteristics under a UV excitation and had a uniform nanostructured particle size distribution which is favorable for high performance LED. These results indicate that the synthesized phosphor may be hopeful candidate for white light emitting phosphor for white LEDs. Eventually, the photoluminescence properties of these compounds under near UV excitation are expected to make it applicable as an efficient novel luminescent material for WLED.

Biography:

Dr. K.N. Shinde has completed his Ph. D. 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 an assistant professor and the Director of R & D at N.S. Science and Arts College, Bhadrawati, India.

He has published more than 50 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. He published a book on "Phosphate Phosphors for Solid State Lighting" with International Publication Springer series in material science. One Korean patent is on his credit. He is an active member of International Center for Diffraction Data (ICDD), USA.

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