

Photoluminescence studies of Samarium ions doped tungstate phosphors for w-LEDs

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Abstract - In the present research work, a Sm^{3+} ions doped Tungstate phosphor that emits light in orange-red region has been synthesized using the high temperature solid-state method. An X-ray diffractometer is used to record the XRD pattern for the as-synthesized phosphor material was recorded for structural analysis and phase identification. The optical band gap value of the as-synthesized phosphor has been measured using diffuse reflectance spectra (DRS). The photoluminescence (PL) spectral features recorded for the Sm^{3+} ions activated tungstate phosphor under 336 nm excitation reveal strong emission peaks in orange and red regions corresponding to wavelengths 582 and 614 nm. From the recorded PL spectra, the CIE chromaticity coordinates (0.58791, 0.41152) estimated for the optimized sample and found to be in orange-red region. CCT value (1737K) signifies its application for warm white light-emitting diode (w-LEDs). The temperature-dependent PL (TDPL) measurements demonstrate the behavior of the as-prepared Sm^{3+} ions doped tungstate phosphor with temperature. All the investigations carried out finally allow us to contemplate the suitability of Sm^{3+} ions doped tungstate phosphor for w-LEDs.

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