



Contribution ID: 18

Type: **Poster**

Synthesis, Structural, and Spectral Studies of Mn²⁺ doped LiSrVO₄ for Lighting Applications

Monday 1 December 2025 16:00 (1 hour)

This study presents a simplistic way to synthesize LiSr(1-x)VO₄: xMn²⁺ nanophosphors with 0.25 ≤ x ≤ 3.0 mol% by using combustion method. The structural, spectral and optical properties were examined using XRD, UV-Vis spectroscopy, Scanning Electron Microscopy (SEM), Energy Dispersive Analysis of X-rays (EDAX), Transmission Electron Microscopy (TEM) and Photoluminescence (PL) spectroscopy. The XRD peaks confirmed that the synthesized nanophosphors were stabilized in monoclinic phase having space group P2₁/m. The grain size of around 34.92 nm was calculated from the Lorentz fitting of histogram, which is in agreement with the XRD data. By varying the amount of dopant, value of band gap initially decreases and then increases with the increase in concentration of Mn²⁺ due to mid gap absorption phenomenon. SEM supplies prodigious details about the microstructure of the nanophosphors. The particles are agglomerated and spherical in nature. The EDS image show the presence of all the elements except Li. TEM studies also confirm that the particle size lies in the nm range. Initially, a red shift is observed in the band gap for low amount of the transition metal ion Mn²⁺ in LiSrVO₄ host which is followed by an augment in the band gap values for higher concentrations. The co-relation of band gap, refractive index and metallization criterion is also investigated. Photoluminescence excitation (λ_{em} = 380 nm) and the emission spectra shows three sharp emission peaks located at 421 nm, 487 nm and 532 nm covering the violet - blue region. The optical studies showed that the peak excitation match quite well within the emission range (370 –420 nm) of commercially available n-UV InGaN LEDs suggesting that this material can be employed in UV LEDs. The CIE coordinates and the dominant wavelength corresponds to the blue region.

Author: SHARMA, Parul (Cluster University of Jammu)

Co-author: Dr PATHANIA, Kamni

Presenter: SHARMA, Parul (Cluster University of Jammu)

Session Classification: Poster Session

Track Classification: Topical Groups: Condensed Matter & Materials