Contribution ID: **2047** Type: **Oral**

The alteration of Li2SrSiO4 via Ga doping for application in LEDs

Monday 27 October 2025 12:15 (15 minutes)

In this study, Li2SrSiO4:Ga (0.2, 0.4, 0.6, 0.8, and 1%) series phosphors were synthesised by the combustion method. Crystal structural analysis through X-ray diffraction (XRD) confirmed a hexagonal crystal structure of the prepared nanocomposites. SEM revealed differences in morphology with increasing dopant content. EDS analysed the elemental composition of the nanocomposites. The vibrational characteristics were elucidated by FTIR spectroscopy. The bandgap estimated from UV-Vis decreased as the concentration of Ga3+ increased. Increasing Ga3+ concentration to 0.8% led to a gradual decrease in the 500 nm peak and a drastic increase in the 740 nm peak of the photoluminescence emission intensity, while 1% increase for both peaks. The CIE chromaticity analysis of samples proved that the phosphor emits warm white light according to the CCT values.

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Session Classification: Condensed Matter Physics

Track Classification: Condensed Matter Physics