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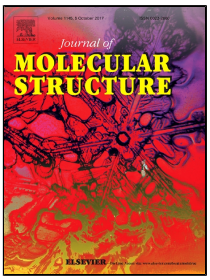

Structural and Photoluminescence behavior of thermally stable Eu^{3+}activated $CaWO_4$ Nanophosphors via Li^+ incorporation.

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Structural and Photoluminescence behavior of thermally stable Eu^{3+}activated $CaWO_4$ Nanophosphors via Li^+ incorporation.

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Abstract:

We have studied the structural and photo physical analogue of Eu^{3+} activated $CaWO_4$ nanophosphors via Lithium (Li^+=2, 5 7 and 10 at.%) ion incorporation. As-prepared (APS) samples were annealed at 900 °C to eliminate unwanted organic moieties present in the sample and to improve crystallinity. The samples are characterized employing X-ray diffraction (XRD), Fourier transform IR spectroscopy (FTIR), UV-VIS spectroscopy, photoluminescence studies and lifetime decay studies. FTIR features an absorption band at ~832 cm^{-1}, which correspond to its antisymmetric vibrations into O-W-O band in the WO_4^{2-} tetrahedron. $CaWO_4$ having the scheelite type structure with C_{4h} point group and I41/a space group. The surface morphology of the samples are studied with Scanning Electron Microscopy (SEM). Lithium Co-doped $CaWO_4$:Eu^{3+} nanoparticles show red luminescence because of strong host contribution and different energy transfer rates from host to Eu^{3+} ions under 266nm excitations. Lithium ion enhances the crystallinity and radiative transition rate thus results in higher emissive property. Calculated CIE co-ordinates of these Li^+ doped 900 ^oC annealed samples under 266 nm excitation is x = 0.65 & y = 0.34, which are closer to the standard of NTSC (x = 0.67 & y = 0.33). This material may be potential candidates for white light emitting diodes.

KEYWORDS: Energy Transfer, Thermal Stability, Lifetime.

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