

Abstract Submitted
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Synthesis,

Morphology, and Optical Characterization of Nanocrystalline $\text{Er}^{3+}:\text{Y}_2\text{O}_3$ ¹
SREERENJINI CHANDRA, FRANCIS LEONARD DEEPAK, JOHN B. GRUBER, DHIRAJ K. SARDAR, UTSA — We describe a methodology to synthesize trivalent erbium doped yttrium oxide ($\text{Er}^{3+}:\text{Y}_2\text{O}_3$) nanoparticles having an average diameter of about 25 nm. The room-temperature absorption spectrum obtained between 400 and 900 nm wavelength range and the fluorescence spectra of the Er^{3+} ($4f^{11}$) ${}^2H(2)_{11/2} + {}^4S_{3/2} \rightarrow {}^4I_{15/2}$ and ${}^4F_{9/2} \rightarrow {}^4I_{15/2}$ transitions were analyzed in detail. The lifetimes for the ${}^2H(2)_{11/2} + {}^4S_{3/2}$ and ${}^4F_{9/2}$ metastable states have been measured and investigated the effect of Er^{3+} concentrations and particle size on the emission intensity and decay times. The detailed structural and optical analyses suggest that the nanoparticles of $\text{Er}^{3+}:\text{Y}_2\text{O}_3$ have potential applications in diverse fields of photonics including laser systems and optical communication devices.

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