

Abstract Submitted
for the TSF12 Meeting of
The American Physical Society

Optical properties of hierarchical architectures of $\text{YBO}_3:\text{Eu}^{3+}$ phosphor SANDEEP SOHAL, Department of Physics, Texas Tech University, Lubbock, TX, XIANWEN ZHANG, ARCHIS MARATHE, JHARNA CHAUDHURI, Department of Mechanical Engineering, Texas Tech University, Lubbock, TX, MARAUO DAVIS, LOUISA J. HOPE-WEEKS, Department of Chemistry & Biochemistry, Texas Tech University, Lubbock, TX, MARK HOLTZ, Department of Physics, Texas Tech University, Lubbock, TX — We investigated nano- and micro-structures of $\text{YBO}_3:\text{Eu}^{3+}$ phosphor synthesized using a hydrothermal approach for white light emission applications. Optical properties using photoluminescence (PL) technique were examined under different excitation wavelengths, ranging from the deep to near ultraviolet. Single crystal nanoflakes gathered together to evolve into a hierarchical architecture through self assembly processes with eight different types of three dimensional morphologies. The samples show narrow-line width orange (O) and red (R) PL at 592, 611, 627 nm at all excitation wavelengths. The PL originates from ${}^5\text{D}_0-{}^7\text{F}_J$ ($J = 1,2,3,4$) transition levels of Eu^{3+} . $\text{YBO}_3:\text{Eu}^{3+}$ prepared using ethanol solvent has the highest R/O ratio with chromaticity coordinates (0.64, 0.33) in Commission Internationale de l'Eclairage (CIE) diagram. We observed that the R/O ratio increases as we go from deep to near ultraviolet excitation, indicating that different luminescence centers of Eu^{3+} exist in YBO_3 in samples.

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Date submitted: 20 Sep 2012

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