

NANOCRYSTALS OF BaWO₄:Dy³⁺ AND SrWO₄:Dy³⁺ SYNTHETIZED BY GREEN CHEMISTRY METHOD

Reference	Presenter	Authors (Institution)	Abstract
03-076	Maria Claudia Faça Cunha Felinto	Felinto, M.C. (IPEN);	<p>Nowadays, the investigation of oxide based light emitting materials for white light emitting diodes (w-LEDs) or device applications have generated interest due to the advantages such as long lifetime, low energy consumption, high luminescence efficiency and environmental friendliness [1]. These qualities make them a strong candidate for the solid state lighting, display devices, optoelectronic devices and light-emitting diodes (LEDs). In this work, we present results of Dy³⁺: BaWO₄ and Dy³⁺: SrWO₄ that present luminescence close to white color (Figure 1) left. They were synthesized using co-precipitation method. The emission spectra exhibit four emission transitions centered at around 486 nm, 576 nm, 665 nm and 760 nm corresponding to the transitions 4F_{9/2}→6H_{15/2} (blue), 4F_{9/2}→6H_{13/2} (yellow) 4F_{9/2}→6H_{11/2} and 4F_{9/2}→6H_{9/2} 6F_{11/2} (red) respectively. Among these transitions 4F_{9/2}→6H_{15/2} and 4F_{9/2}→6H_{13/2} are observed to be strong whereas 4F_{9/2}→6H_{11/2} transition is found to be relatively quite weak. The 4F_{9/2}→6H_{13/2} transition is hypersensitive in nature and is strongly influenced by the environment around the Dy³⁺ ion site. It is observed in the luminescence spectra of these materials that the electric dipole transition is dominant compared to the magnetic dipole transition. The CIE diagram show emission close to white (Fig.1 right) for the five composition with little distortion of the color showing the influence of dopant concentration in the color of the emission. Figure 1. Dy³⁺: BaWO₄ under UV excitation (366nm) left, emission spectra under excitation at 350nm middle and chromaticity coordination diagram of BaWO₄:Dy³⁺ material. References: [1] H. P. Barbosa , J. Kai, I.G. N. Silva, L. C. V. Rodrigues, M. C. F. C. Felinto, J. Hölsä, O. L. Malta, H. F. Brito, J. Lumin., 170 (2016) 736–742. [2] A. M. Kaczmarek, R. Van Deun, Chem. Soc. Rev.,42 (2013) 8835–848.</p>