

Red to Warm White Light Emission Tuning on GdVO₄ : Eu³⁺ Dy³⁺ phosphors

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Nowadays, phosphor materials with luminescent properties have been widely studied due to its exceptional capacity of converting UV to visible light. Many lanthanide doped orthovanadates are strong candidates for optoelectronic applications. In this regard, the growing demand of efficient lighting systems requires to achieve three fundamental premises: the emission of white light (or as close possible), reduction of energy costs associated with the processes of excitation and finally, the reduction of toxic materials to the environment.

The aim of the present work is to develop a sol-gel synthesis of GdVO₄:Eu³⁺, Dy³⁺ powders with highly emission intensity. The used precursors were ammonium metavanadate, gadolinium, europium and dysprosium nitrates as metal sources, ethanol as solvent, citric acid as chelating agent and ethylene glycol as stabilizer. The powders were heat-treated from 600-1100 °C, and it was analyzed the effect on chemical (FTIR), structural (XRD) and morphological (SEM) properties on obtained powders. The luminescence study was carried out for different molar content of Eu³⁺ and Dy³⁺ in order to study the energy transfer mechanism between the ions, and the color emission tuning with different molar content.