

Sol-Gel Synthesis and Photoluminescent Properties of YPO₄: Pr³⁺ Nanophosphors

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Abstract : For many years, the luminescent materials were investigated principally in the infrared and visible areas, because the ultraviolet (UV) and especially in vacuum Ultraviolet (VUV) are technically more difficult to explore, especially absence of applications requiring of materials suitable to short wavelengths. Recent necessary, related to the development of certain technologies, encouraged research in these spectra domains. It is in this context that the 4F_n-4F_{n-1} 5d transitions of rare earth in insulating materials, lying in the UV and VUV, are the aim of large number of studies. These studies relate in particular to search for new scintillator materials used for spectroscopy and X-ray, γ , as well as medical imaging. The 4F_n- 4F_{n-1}5d transitions of the rare earth dependent to the host-matrix, several matrices ions were used to study these transitions, in this work we are suggesting to study on a very specific class of inorganic scintillators that are orthophosphate doped with rare earth ions, this study focused on the Pr³⁺ concentration on the structural and optical properties of Pr³⁺ doped YPO₄ (yttriumorthophosphate) with powder form prepared by the Sol Gel method.

Keywords : rare earth, scintillator, YPO₄:Pr³⁺ nanophosphors, sol gel, 4F_n-4F_{n-1}5d transitions

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