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THE EFFECT OF TB3+ IONS CONCENTRATION ON THE MORPHOLOGY, STRUCTURE AND PHOTOLUMINESCENCE OF $GD_2O_2SO_4$: TB3+ PHOSPHOR OBTAINED BY THERMAL DECOMPOSITION OF SULFATE HYDRATED

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Rare earths (RE) are widely explored to develop luminescent materials which may find use in such applications as lasers, optical markers, phosphors, semiconductor materials and X-ray detectors. Rare earth sulfonates have attracted attention because they can be obtained with simple and cost-effective methods for potential technological applications as luminescent thin films. The characteristic features of the electronic spectroscopy of the RE3+ ions include the narrow emission lines and long lifetimes due to the intra configurational 4f–4f transitions. The oxysulfides and oxysulfate (RE_2O_2S/$RE_2O_2SO_4$) of rare earth has been widely exploited as optical materials due to their applicability and easy production. Recently, the oxysulfates and oxysulfides has being largely used as Tb3+ (green), Eu3+ (red) and Dy3+ (yellow/blue) colors ions. In this work, the $Gd_2O_2SO_4$:Tb3+ optical material was obtained by thermal decomposition of sulfate hydrated under air atmosphere The photo luminescent investigation of $Gd_2O_2SO_4$:Tb3+ material showed that the brightness of terbium-activated gadolinium oxysulfate phosphors was enhanced with increase of the concentration of Tb3+ and the distributions of size particles were decreased with controlling by doping the phosphor. The structure and purity was confirmed with XPD powder diffractions according JCPDS # 41-0684. The $Gd_2O_2SO_4$: is a good host to Tb3+ and ions exhibit better intensity of transitions in the $^5D_4$-->$^7F_2$ narrow lines monitored at 545,5 nm.

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Biography

Rodrigo V Rodrigues has completed his PhD at the São Paulo University (USP), São Paulo, Brazil. He is the collaborator of Thermal Analysis Laboratory (USP) and the Institute of Low Temperature Structure and Research INTIBS-PAN, Wroclaw, Poland. His research work includes developing materials using the TG/DTG/DSC Thermal Analysis Techniques and TG/MS in the part of obtaining and characterizing the application of thermogravimetry to obtain nanomaterial and luminescent materials, studying kinetic methods (Ozawa) in determining the time of life of compounds and in the study of photoluminescence applications of the excitation and emission spectra of the luminescence of rare earth elements RE. He has published some papers in reputed journals and has been serving as an Editorial Board Member of repute. He has collaborations with São Paulo University USP, Brazil; Turku University, Finland and Institute of Low Temperature of Wroclaw – INTIBS – Poland.

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