

LUMINESCENCE OF LITHIUM-PHOSPHATE-BORATE GLASSES DOPED WITH Tb_3^+ AND Pr_3^+ IONS

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The oxide glass doped with rare-earth ions (REI), as active media in optoelectronics; as scintillation materials for imaging radiation fluxes; UV-Vis radiation converters are widely used. Simplicity of synthesis of glassy materials, the ability to manufacture optical elements of any shape and size, relatively low cost, possibility to incorporate impurities, changes in the composition of the host and high optical homogeneity makes them an alternative to single crystals.

In this work glasses of composition $Li_2O-B_2O_3-P_2O_5-CaF_2$ (LBPC) doped with Tb_3^+ , Pr_3^+ and co-doped Pr_3^+/Tb_3^+ ions with different concentration of Pr_3^+ ions from 0.2 to 1 wt % was studied. The samples at the Institute for Single Crystals of National Academy of Sciences of Ukraine (Kharkov) were synthesized. Optical analysis of these glasses has been carried out based on the measurements of absorption, excitation and emission spectra.

For all investigated samples occurs luminescence in «blue-green» region spectra. The radiative transitions occur from the excited states $5D_3$, $5D_4$ to the ground state $7F_j$ in terbium ions. It was found that quenching process can occurs when the concentration of Pr_3^+ increase from 0.2 to 1 wt% at main luminescence bands of terbium ions. The decay kinetics of luminescence glasses excited electrons beams was studied in detail. The mechanism of energy transfer between Tb_3^+ and Pr_3^+ ions are discussed.

Keywords: *glasses, scintillators, rare earth ions, luminescence decay kinetics.*