

Abstract Submitted
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Study of Optical Absorption and Fluorescence of Pr³⁺ Doped Lead Boro-Germanate Glasses SUMAN GAUTAM, P. K. BABU, SAISUDHA MALLUR, Western Illinois University — Lead boro-germanate glasses doped with Pr³⁺ ions [x PbO-10 GeO₂(90-x) B₂O₃0.5 Pr₂O₃, x = 20, 30, 40, 50, 60 mol %] are prepared by the conventional melt quenching technique. The glasses are studied using optical absorption, refractive index, and fluorescence measurements. The refractive index is measured using the Brewster's angle method. Optical absorption is recorded by a Varian CARY 5G UV-VIS spectrometer. From the absorption spectra, oscillator strengths, intensity parameters and radiative transition probabilities are calculated. The Pr³⁺ fluorescence spectrum is obtained by exciting the glass sample at 445 nm wavelength and examining the light emitted by the excited atoms with a LEOI-101 modular multifunctional grating spectrometer. Stimulated emission cross section (σ_P) is one of the most important optical parameters and large values of that can improve the efficiency of energy conversion process in a photovoltaic cell operation. We obtained the stimulated emission cross section for Pr³⁺ fluorescing transitions using the optical absorption parameters and fluorescence parameters. σ_P values are found to be large for these glasses and it shows compositional dependence

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