

Abstract Submitted
for the PSF17 Meeting of
The American Physical Society

Study of the Physical and Optical Properties of Sm³⁺-doped Lead Boro-tellurite Glasses TANJINA AHMED, P. K. BABU, SAISUDHA MAL-LUR, Western Illinois University — Density, refractive index and optical absorption of Sm³⁺ doped lead boro-tellurite glasses are studied with varying PbO content (29.5 to 49.5 mol%). These glasses are prepared using appropriate amounts of PbO, B₂O₃, TeO₂ and Sm₂O₃ of high purity (99.9%). The raw materials are homogenously mixed and melted in a porcelain crucible at 950⁰C. The melt is air quenched by pouring it on a thick brass plate and covering it immediately with another brass plate. The glass samples obtained are annealed at 350⁰C for 3hrs to remove the thermal and then polished to obtain well reflecting surfaces. The sample density is measured by the Archimedes' method using xylene. The refractive index of the glasses is measured by a Brewster angle set up using a diode laser operating at 650 nm. Optical absorption spectra of these glasses are obtained using UV–VIS-NIR spectrometer. Fluorescence spectra are obtained by using a 404 nm laser as the excitation source. The dependence of intensity parameters with composition reveals the variation of local symmetry of Sm³⁺ in the glass matrix as well as the covalency of Sm-O bonds. Large stimulated cross sections obtained from fluorescence measurements indicate that these glasses could be used for photonic applications.

Tanjina Ahmed
Western Illinois University

Date submitted: 23 Oct 2017

Electronic form version 1.4