

## Effect of lanthanum oxide on optical properties of zinc borotellurite glass system

### ABSTRACT

A series of zinc borotellurite glasses doped with lanthanum oxide with the chemical composition  $\{[(\text{TeO}_2)_{0.70}(\text{B}_2\text{O}_3)_{0.30}]_{0.7}(\text{ZnO})_{0.30}\}_{1-x}(\text{La}_2\text{O}_3)_x$  where  $x = 0.01, 0.02, 0.03, 0.04,$  and  $0.05$  molar fraction have been fabricated using conventional melt-quenching method. The structural properties of the fabricated glass samples were determined by X-ray diffraction (XRD) analysis and Fourier Transform Infrared (FTIR) analysis. XRD result confirmed that the fabricated glasses are amorphous. Density and molar volume of the prepared samples were measured and calculated. The optical properties of the prepared glasses were determined by UV-Vis analysis. The optical absorption spectra reported that the fundamental absorption edge shifts to lower wavelength as the amount of  $\text{La}_2\text{O}_3$  increases. The refractive index, direct optical energy band gap, indirect optical energy band gap and Urbach energy had been calculated and analyzed.

**Keyword:** Borotellurite glass; Optical band gap; Optical absorption coefficient