

## **Influence of erbium concentration on spectroscopic properties of tellurite based glass**

### **ABSTRACT**

Erbium zinc borotellurite,  $\{[(\text{TeO}_2)_{0.70}(\text{B}_2\text{O}_3)_{0.30}]_{0.7} (\text{ZnO})_{0.3}\}_{1-y} (\text{Er}_2\text{O}_3)_y$  glasses were prepared by rapid melt-quenching method. The structural properties of the glass samples were determined by using x-ray diffraction (XRD) method and was confirmed its amorphous nature. The FTIR analysis shows that the Erbium Oxide increases the number of non-bridging oxygen that affects the bonding structure of  $\text{TeO}_2$ ,  $\text{ZnO}$  and  $\text{B}_2\text{O}_3$ . The absorption edge gives the value of band gap  $E_{\text{opt}}$  and Urbach energy  $E_u$ . The value of  $E_{\text{opt}}$  lies between 3.025 eV and 3.440 eV for indirect band gap and between 3.500 eV to 3.680 eV in the direct band gap. The Urbach energy shows non-linear with the concentration of Erbium Oxide and varies within 0.153 eV and 0.200 eV.

**Keyword:** Optical materials; Fourier transform infrared spectroscopy (FTIR); Optical band gap