

INFLUENCE OF ERBIUM CONCENTRATION ON SPECTROSCOPIC PROPERTIES OF TELLURITE BASED GLASS

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ABSTRACT

Erbium zinc borotellurite, $\{[(\text{TeO}_2)_{0.70}(\text{B}_2\text{O}_3)_{0.30}]_{0.7}(\text{ZnO})_{0.3}\}_{1-y}(\text{Er}_3\text{O}_2)_y$ 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 TeO_2 , ZnO and B_2O_3 . The absorption edge gives the value of band gap E_{opt} and Urbach energy ΔE . The value of E_{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.

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

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