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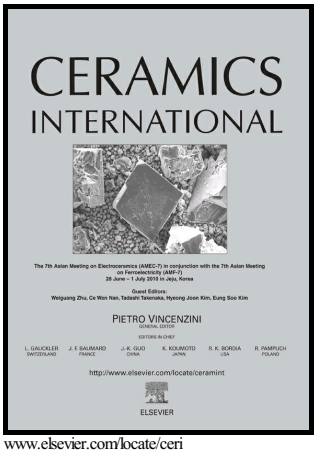

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Thermal, FTIR and UV spectral studies on Tellurite Glasses doped with Cerium Oxide

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Accepted manuscript

Abstract

Tellurium oxide-based glasses in the form of $75TeO_2 – 10ZnO – (10-x)Nb_2O_5 – 5Li_2O – xCe_2O_3$; where x = 0.5, 1, 1.5, 2, 2.5 mol%, were prepared by using the melt-quenching method. X-Ray Diffraction pattern (XRD) detected the amorphous nature of all the prepared glasses. Physical properties like density (ρ), molar volume (V_m), and oxygen packing density (OPD), have been determined and calculated. Fourier transform infrared spectroscopy (FTIR) studies showed that the glass network contains TeO_4, TeO_{3+1}/TeO_3, ZnO_4, and NbO_6 as structural units. The glass transition temperature (T_g), onset of glass crystallization temperature (T_x), crystallization temperature (T_c), and melting temperature (T_m) have been determined by using differential scanning calorimetry (DSC). The optical band gap (E_{opt}), the Urbach energy (ΔE), and the cut off wavelength (λc) were determined through the optical absorption data.

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