

## Investigation of Yb<sup>3+</sup> doped Calcium Boro-tellurite glasses Structural Properties

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The tellurite glasses are known to have low phonon energy, high density and refractive index, great corrosion resistance and a good solubility rare earth (RE). These features make tellurite glasses a promising candidate for technological applications, such as optical fiber for telecommunications. Several studies have been show that B<sub>2</sub>O<sub>3</sub> addition to tellurite glasses improves their thermal and chemistry stability [1]. Among several boro-tellurite glass systems calcium boro-tellurite glasses (CBT) has present great potential for optical applications and RE doping. The RE ion Ytterbium (Yb<sup>3+</sup>) presents simple energy diagram, long lifetime, no relaxation by multifonon, a main emission an infrared and is often used for high-power lasers [2]. In this work, high purity reagents were used to prepare CBT glasses with nominal compositions: 10CaF<sub>2</sub> - (28-0,4x)CaO - (60 - 0.6x)B<sub>2</sub>O<sub>3</sub> - xTeO<sub>2</sub> - 2Yb<sub>2</sub>O<sub>3</sub> with (x = 20, 30, 40, 50 and 70% wt) by a process the melt-quenching in an electrically-heated furnace. The structural studies were carried out by using XRD, FT-IR, Raman Spectra, density measurements, and the thermal analysis by using DTA and specific heat. The results are discussed in terms of tellurium oxide content and their changes in structural and thermal properties of glass samples.

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[1] PREZAS, P. R.; SOARES, M. J.; FREIRE, GRAÇA. M. P. F. Structural, electrical and dielectric characterization of TeO<sub>2</sub>-WO<sub>3</sub>-Y<sub>2</sub>O<sub>3</sub>-ER<sub>2</sub>O<sub>3</sub>-YbO<sub>3</sub> glasses. **Elsevier:** Materials Research Bulletin, v. 68, 2015.

[2] BARUA, P.; SKIYA, E. H.; SAITO, K.; IKUSHIMA, A. J. Influences of Yb<sup>3+</sup> ion concentration on the spectroscopic properties of silica glass. **Elsevier:** Journal of Non-Crystalline Solids, v. 354, 2008.