

## **The effect of remelting on the physical properties of borotellurite glass doped with manganese.**

### **Abstract**

A systematic set of borotellurite glasses doped with manganese  $(1-x)$   $[(B_2O_3)_{0.3}(TeO_2)_{0.7}]_xMnO$ , with  $x = 0.1, 0.2, 0.3$  and  $0.4$  mol%, were successfully synthesized by using a conventional melt and quench-casting technique. In this study, the remelting effect of the glass samples on their microstructure was investigated through density measurement and FT-IR spectra and evaluated by XRD techniques. Initial experimental results from XRD evaluation show that there are two distinct phases of glassy and crystallite microstructure due to the existence of peaks in the sample. The different physical behaviors of the studied glasses were closely related to the concentration of manganese in each phase. FTIR spectra revealed that the addition of manganese oxide contributes the transformation of  $TeO_4$  trigonal bipyramids with bridging oxygen (BO) to  $TeO_3$  trigonal pyramids with non-bridging oxygen (NBO).

**Keyword:** Borotellurite glass; Bridging oxygen; Density; FTIR spectra.