Thermal stability and effect of heat treatment on manganese doped silica borotellurite glass

ABSTRACT

Glasses with chemical formula of {[(TeO2)0.7(B2O3)0.3]0.8[SiO2]0.2}1-x{MnO2}x where x = 0.00 ≤ x ≤ 0.05 molar fraction were fabricated using melt quenching technique. The temperature used in the heat treatment process of the glass sample is 600?C. Calorimetric measurement had been carried out to study the thermal properties of the fabricated glass. The crystallization kinetics of the glass system we reexamined under non-isothermal conditions via differential scanning calorimetric (DSC). The glass transition (Tg), onset glass transition (To), maximum crystallization temperature (Tc) and melting temperature (Tm) were determined. Results from DSC proved that the studied glasses have good thermal stability (Ts) in which indicates its high resistance to devitrification. Strong indicator for the glass forming ability of a glass material, Hurby parameter (Kgl) was also calculated in this research.

Keyword: Manganese; Thermal stability; DSC; Heat treatment