Elastic constants and thermal properties of lead-bismuth borate glasses

ABSTRACT

Systematic series of lead-bismuth borate glasses, where PbO, Bi2O3 and B2O3 content change for every series based on their weight percentage have been prepared. The ultrasonic and glass transition temperature (Tg) of this glass system have been studied using the Matec MBS-8000 Digital Signal Processing and conventional Differential Thermal Analysis (DTA) method. Elastic properties of the glass have been calculated together with Poisson's ratio from the measured densities as well as longitudinal (VL) and shear (VS) ultrasonic velocities. The Tg determined from the change of the base line in the DTA chart. The result showed that both properties are much depends on the changes of their atomic arrangement behaviour with an addition of the modifiers.

Keyword: Differential Thermal Analysis (DTA); Elastic moduli; Glass transition temperature; Lead-bismuth borate glasses; Ultrasonic velocities