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Structural and Thermal Investigations on Sodium Alumino Borate Glasses

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Abstract : Glasses of $70B_2O_3$-$(30-x)Na_2O$-xAl_2O_3 systems with different Al_2O_3 content (where x = 5, 10, 15, 20 and 25 mol%) have been prepared by melt quench technique. X-Ray diffraction (XRD), Scanning Electron Microscope (SEM), Fourier Transform Infra Red (FT-IR) spectroscopy and Thermo Gravimetric Differential Thermal Analysis (TG-DTA) studies have been employed to study the role of Al_2O_3 on the structure of the investigated glass system. The amorphous nature of these samples was verified by XRD and SEM is used to study the morphology of these glass samples. FT-IR spectrum reveals the characteristic absorption bands due to various groups of triangular and tetrahedral borate network. Glass transition temperature, crystallization temperature and thermal stability were determined by TG-DTA investigations.

Keywords : sodium borate glass,FTIR,TG-DTA,XRD,SEM.

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