Abstract Submitted
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Molecular structure of $\mathbf{Si}_x\mathbf{Ge}_x\mathbf{Te}_{100-2x}$ glasses[1] K. GUNASEKERA, P. BOOLCHAND, University of Cincinnati, S. MAMEDOV, Horiba Jobin Yvon Inc., New Jersey — Bulk glasses of the titled ternary have been synthesized in the 8% < x < 16% range by melt quenching. Glass transition temperatures, T_g(x), increase linearly from 140°C at x = 8% to 200°C at x = 12%, then decrease steadily to 160°C thereafter. The non-reversing enthalpy of relaxation at T_g shows a broad minimum near 9% but a maximum near 12%. Glasses appear to be fully polymerized at x < 12%, but segregate as x > 12%. The broad minimum near 9%, most likely, represents the opening of an Intermediate Phase. Raman scattering, excited using 785 nm radiation of a glass at x = 10%, shows two modes, a broad one near 160 cm^{-1} and a narrow one near 127 cm^{-1}. A mode near 157 cm^{-1} has been previously[2] identified with polymeric Te_n chains of a-Te. Tentatively, we assign the 127 cm^{-1} mode with face-sharing[3] $GeTe_4$, and a mode near 170 cm^{-1} with edge-sharing $SiTe_4$ tetrahedra in these glasses. The nature of glass structure evolution with composition will be elucidated.

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[2]M.Brodsky, Phys. Stat. Solidi(b) 52, 609 (1972)
[3]M. Malyj et al. Phys. Rev. B 31, 3672 (1985)

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