Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Elastic phase diagrams of ternary Ge-P-S bulk glasses U. VEMPATI, P. BOOLCHAND, University of Cincinnati — Elastic phases of network glasses can be identified from a measurement of the non-reversing enthalpy (ΔH_{nr}) near T_g in T-modulated DSC. Glasses at low mean coordination number $\boldsymbol{r} < \boldsymbol{r}_c(1)$ possess a narrow $\Delta H_{nr}(T)$ term that generally increases by an order of magnitude upon aging, which is characteristic of mechanically *floppy phases*. Glasses in a $\boldsymbol{r}_c(1) < \boldsymbol{r} < \boldsymbol{r}_c(2)$ range possess a ΔH_{nr} term that is minuscule and does not age, which is characteristic of *intermediate* or *self-organized phases* (IP). And glasses at high $\boldsymbol{r} > \boldsymbol{r}_c(2)$ possess a broad and asymmetric $\Delta H_{nr}(T)$ term that ages, which is characteristic of *stressed rigid phases*. Raman scattering and MDSC measurements on ternary $Ge_xP_xS_{1-2x}$ glasses have now been performed[1] and show $\boldsymbol{r}_c(1) = 2.270$ and $\boldsymbol{r}_c(2) = 2.405$, yielding an IP width ($\Delta\boldsymbol{r}$) of 0.135. Here $\boldsymbol{r} = 2 + 3x$. In corresponding selenide glasses the IP width is found[2] at 0.210. The reduced width of the IP in sulfide glasses is attributed to S_8, P_4S_7 and P_4S_{10} molecules demixing. By combining the present results with those on binary Ge-S and P-S glasses, elastic phase diagrams of ternary Ge-P-S glasses have now been constructed, and provide a global view of the three elastic phases.

1. U. Vempati and P. Boolchand, J. Phys.: Cond. Matter, **16** S5121 (2004)
2. S. Chakravarty et al. J. Phys.: Cond. Matter (in press)

Supported by NSF grant DMR 04-56472

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Date submitted: 30 Nov 2004 Electronic form version 1.4