

Abstract Submitted
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Evidence of an Intermediate Phase in bulk alloy oxide glass system¹ S. CHAKRABORTY, P. BOOLCHAND, University of Cincinnati — Reversibility windows have been observed in modified oxides (alkali-silicates and -germanates) and identified with Intermediate Phases(IPs).² Here we find preliminary evidence of an IP in a ternary oxide glass, $(\text{B}_2\text{O}_3)_5(\text{TeO}_2)_{95-x}(\text{V}_2\text{O}_5)_x$, which is composed of network formers. Bulk glasses are synthesized across the $18\% < x < 35\%$ composition range, and examined in Raman scattering, modulated DSC and molar volume experiments. Glass transition temperatures $T_g(x)$ steadily decrease with V_2O_5 content x , and reveal the enthalpy of relaxation at T_g to show a global minimum in the $24\% < x < 27\%$ range, the reversibility window (IP). Molar volumes reveal a minimum in this window. Raman scattering reveals a Boson mode, and at least six other vibrational bands in the $100 \text{ cm}^{-1} < \nu < 1700 \text{ cm}^{-1}$ range. Compositional trends in vibrational mode strengths and frequency are established. These results will be presented in relation to glass structure evolution with vanadia content and the underlying elastic phases.

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²V. Rompicharla J. Phys.: Condens. Matter 20, 202101 (2008).

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