Abstract Submitted
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The sharpness of thermally reversing windows as a measure of glass network homogeneity[1] S. BHOSLE, K. GUNASEKERA, P. BOOLCHAND, University of Cincinnati, M. MICOULAUT, University of Paris IV, C. MASSOBRIO, University of Strassbourg — Reversibility windows(RWs) have been observed[2] in Chalcogenides, modified- and unmodified-oxides, and solid electrolytes. These are identified with isostaticaly rigid networks formed in narrow compositional windows between flexible and stressed-rigid elastic phases. Until recently, we found RWs in oxides and solid electrolytes to be sharper than in chalcogenides. Recently we introduced[3] a Raman profiling method to track homogeneity of melts during synthesis, and found that the kinetics of homogenization of chalcogenide melts are slow. The enthalpy of relaxation at T_g measured in binary Ge_xSe_{100-x} glasses show the RW to be intrinsically square-well like with sharp edges in homogeneous samples ($\Delta x \sim 0$), and becomes trapezoidal ($\Delta x = 1.5\%$), then triangular ($\Delta x = 3\%$) and eventually disappears as glass heterogeneity increases. The heterogeneity deduced from Raman profiling experiments provides the Ge-stoichiometry variation (Δx) across a batch composition, which can be used to predict the observed RWs.

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[2]Boolchand et al., Phil. Mag 85, 3823 (2005)
[3]Bhosle et al., Sol. St. Comm. 151, 1851 (2011)

Kapila Gunasekera
University of Cincinnati

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