

Abstract Submitted  
for the MAR17 Meeting of  
The American Physical Society

**Fragility Index variation in  $(\text{Li}_2\text{O})_x(\text{B}_2\text{O}_3)_{100-x}$  melts** CHARLES SKIPPER, RALPH CHBEIR, CHANDI MOHANTY, PUNIT BOOLCHAND, Univ of Cincinnati — We have measured the fragility index ( $m$ ) of titled melts as a function of  $\text{Li}_2\text{O}$  content in the  $0 < x < 35\%$  range using Modulated DSC. In this approach, one measures the real and imaginary part of the complex specific heat as a function of modulation frequency ( $\nu$ ), and deduces an activation energy by plotting the log of the enthalpy relaxation time as a function of inverse Temperature obtained at various  $\nu$ . For pure  $\text{B}_2\text{O}_3$  glass with a  $T_g = 308\text{C}$ , we obtain  $m = 28$  (1). With increasing  $x$ ,  $m$  is found to monotonically increase to 38(1) as  $x$  increased to 15%, but then to plateau at a value of  $m = 42$ (2) in the range  $18\% < x < 25\%$ . These values in  $m$  are significantly lower than those reported earlier<sup>1</sup>. In particular, the range of  $x$  where we observe a plateau in  $m$ , authors of ref. 1 observed a linear increase in the  $41 < m < 62$  range.  $T_g$  of our glasses are found to be significantly greater than those of ref. 1, suggesting that the lower value of  $m$  in our glasses could be a manifestation of the reduced concentration of bonded water. The range of  $x$  across which a plateau is observed also happens to coincide where the isostatically rigid Intermediate Phase reported recently<sup>2</sup>. <sup>1</sup> G.D.Chryssikos et al. JNCS **196**, 244 (1996). <sup>2</sup> K. Vignarooban et al. EPL **108**, 56001 (2014).

Charles Skipper  
Univ of Cincinnati

Date submitted: 11 Nov 2016

Electronic form version 1.4