Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Fragility, Intermediate Phase and Polaronic conductivity in heavy metal oxides[1] SHIBALIK CHAKRABORTY, KAPILA GUNASEKERA, PUNIT BOOLCHAND, University of Cincinnati, MOHAMMED MALKI, Polytech'Orléans, MATTHIEU MICOULAUT, UPMC-University Paris 6 — The $(B_2O_3)_5(TeO_2)_{95-x}(V_2O_5)_x$ ternary forms bulk glasses over a wide range of compositions, 18% < x < 35%. Complex C_p(x) measurements as a function of modulation frequency reveal that melt fragility (m) show a global minimum (m = 52(2)) in the 23% < x < 26% range with m > 65 outside that window. These results suggest more stable network structure in the window than outside it. The fragility window coincides with a global minimum of the non-reversing enthalpy of relaxation at T_g, the reversibility window (23% < x < 27%), a behavior also found in chalcogenide glasses. Conductivity (σ) data show three regimes of variation; a low σ at x < 23%, a plateau in 23% < x < 27%, and an exponential increase at x > 27%. The reduced activation energy for conductivity at x > 27% is consistent with increased polaronic mobility as the network becomes flexible. These findings show glasses at x < 23% are *stressed-rigid*, in 23% < x < 27% range in the *Intermediate Phase*, and at x > 27% to be *flexible*.

[1]Supported by NSF grant DMR 08-53957.

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Date submitted: 04 Dec 2012 Electronic form version 1.4