Fragility, Intermediate Phase and Polaronic conductivity in heavy metal oxides\textsuperscript{1} SHIBALIK CHAKRABORTY, KAPILA GUNASEKERA, PUNIT BOOLCHAND, University of Cincinnati, MOHAMMED MALKI, Polytech’Orléans, MATTHIEU MICOULAUT, UPMC-University Paris 6 — The $(\text{B}_2\text{O}_3)_y(\text{TeO}_2)_{95-x}(\text{V}_2\text{O}_5)_x$ 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 ($\sigma$) data show three regimes of variation; a low $\sigma$ 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.

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