

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Intermediate Phase Spectroscopy of
(Na₂O)_x[(B₂O₃)_y(GeO₂)_{1-y}]_{1-x} glasses AARON WELTON, RALPH CHBEIR,
ANDREW CZAJA, PUNIT BOOLCHAND, The University of Cincinnati — The
titled ternary is of interest because the two end members, viz., $y=0$, i.e., Sodium
Germanate ¹, and $y=1$, Sodium Borate ² have been studied earlier and show the
isostatically rigid Intermediate Phase (IP) to occur in the $x=0.14$ to $x=0.19$ range
and in the $x=0.20$ to $x=0.40$ range of soda respectively. In the present work we
now report on bulk glasses at $y=0.75$ synthesized over a wide range $x=0$ to x
 $=0.30$ of soda. Our motivation is to understanding the evolution of the IP in the
pseudo-ternary glasses as the base glass connectivity is altered. Preliminary MDSC
experiments show $T_g(x)$ to increase with x and to reveal a broad maximum at 510
C centered near $x=0.25$. Furthermore, an IP is found in the $x=0.20$ to $x=0.33$
range of soda where a reversibility window is observed. The window is centered near
the T_g^{\max} content at $x=0.25$. IR reflectance show modes of BO₄ and BO₃ units but
also those of bonded water. Raman scattering largely shows modes observed earlier
in Sodium borate glasses². 1 V. Rompicharla et al. J PCM 20, 202101 (2008) 2K.
Vignarooban et al. EPL 108, 56001(2014).

Aaron Welton
The University of Cincinnati

Date submitted: 08 Nov 2016

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