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Confinement effects on the glass transition of the hydrogen bonded liquids. WEI ZHENG, SINDEE SIMON, Texas Tech University — The glass transition behavior of glycerol and propylene glycol confined in nanoporous glass is investigated using differential scanning calorimetry. Both silanized and unsilanized porous glasses are used to confine the liquids with nominal pore sizes ranging from 2.5 to 7.5 nm, and the glass transition temperature (T_g) and the fictive temperature (T_f') are measured on cooling and heating, respectively. On heating, glycerol confined in the unsilanized pores exhibits a T_f' similar to that of bulk unconfined material, whereas in the silanized pores a depressed glass transition is observed. For propylene glycol, similar behavior is observed except that an additional glass transition is observed in both silanized and unsilanized systems approximately 30 K higher than the bulk. The measured T_f's are compared to the literature results, and the confinement effects are discussed. We also emphasize that changes in T_g are not necessarily sufficient to characterize the confinement effects. Dramatic changes are observed for the strength of the transition (ΔC_p) and for the enthalpy overshoot accompanying the glass transition for the materials confined in unsilanized pores even though no changes in T_g are observed.

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