Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Crystallization of a Cyanurate Trimer in Nanopores YUNG P. KOH, SINDEE L. SIMON, Texas Tech University — Nanoconfinement is known to depress the melting temperature through the well-known Gibbs-Thompson equation. Less well studied is the influence of nanoconfinement on crystallization kinetics. In this work we investigate crystallization of a cyanurate trimer using differential scanning calorimetry. The material shows cold crystallization and melting in the bulk state. Under the nanoconfinement of controlled pore glasses (CPG), cold crystallization and melting shift to lower temperatures, following the shift in the glass transition temperature. More importantly, however, the crystallization kinetics slow down and no crystallization occurs in 13 nm-diameter pores. Isothermal crystallization studies indicate that the Avrami exponent is approximately 2.0 for both bulk and nanoconfined samples. The time scale for crystallization is over one order of magnitude longer for samples confined in 50-nm pores in spite of the fact that samples were crystallized the same distance from T_g.

Yung Pyo Koh
Texas Tech University

Date submitted: 18 Nov 2010 Electronic form version 1.4