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Tg Depression and Reactivity of Nanoconfined Monocyanate Ester and its Trimer YUNG P. KOH, SINDEE SIMON, Texas Tech University — The effects of nanoconfinement on the reaction kinetics and the Tg depression of a monocyanate ester and the resulting cyanurate trimer are studied using differential scanning calorimetry (DSC). The monocyanate ester is imbibed in the nanopores of controlled pore glass. The reaction rate is found to increase with decreasing nanopore size without a change in reaction mechanism based on both dynamic heating scans and isothermal reaction studies. Both the monocyanate ester reactant and cyanurate trimer product show reduced Tgs compared to the bulk; the Tg depression increases with conversion and is more pronounced for the fully reacted product, suggesting that molecular stiffness influences the magnitude of nanoconfinement effects. Confinement of the cyanurate trimer synthesized in the bulk and then imbibed in the nanopores indicates that the Tg depression is not due to a change in chemical structure. The results of imbibement studies will also be discussed.

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