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Trimerization of Monocyanate ester in Nanopores. YUNG PYO KOH, QINGXIU LI, SINDEE L. SIMON, Texas Tech University, TEXAS TECH UNIVERSITY TEAM — Nanoconfinement generally results not only in a T_g depression, but also in changes in reactivity. Recently, we showed that the polymerization reaction of bisphenol M dicyanate ester is enhanced in nanopores and that the T_g of the resulting polycyanurate product is depressed relative to the bulk. In order to examine the importance of an intracyclization side reaction, in this work we investigate the effect of nanoconfinement on the reactivity and the T_g of a monocyanate ester and its cyanurate product. Due to the monofunctional nature of the reactant, there is no possibility for the intracyclization side reaction in this system. Using differential scanning calorimetry (DSC), we find the primary T_g decreases with decreasing pore size but the secondary (higher) T_g is independent of pore size. In addition, we find that the trimerization reaction rate increases as confinement pore size decreases, and in the 8 nm pores, the reactivity is accelerated by a factor of 20. The results are consistent with the T_g depression and accelerated reaction found previously for the nanoconfined difunctional reactant.

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