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Cure of Bisphenol M Dicyanate Ester/Polycyanurate under Nanoscale Constraint[1] QINGXIU LI, SINDEE SIMON, Texas Tech University — It is well known that properties are affected by constraint at the nanoscale. Although thermosetting resins have been cured in the presence of nanoparticles and nanotubes, cure of thermosetting resins under the well defined nanoscale constraints imposed by controlled pore glass or similar matrices has not been previously documented. In this work, we investigate the isothermal curing of bisphenol M dicyanate ester/polycyanurate under various nanoscale constraints, including within an aluminum oxide nanofilter, in unsilanized controlled pore glass, and in silanized controlled pore glass. Differential scanning calorimeter and Fourier transform infrared spectroscopy are used to monitor the evolution of the glass transition temperature and the conversion, respectively, as a function of pore size and pore surface chemistry. For the glass transition temperatures of the polycyanurate networks cured in the silanized controlled pore glasses, only nanoconfinement effects are observed; whereas for the material cured in the unsilanized controlled pore glasses, both a nanoconfinement and a surface effect are observed. Furthermore, curing under nanoscale constraint accelerates the cure of bisphenol M dicyanate ester.

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