The Calorimetric Glass Transition under Nanoconfinement

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The behavior of materials confined at the nanoscale has been of considerable interest over the past two decades. Recent work in our laboratory has focused on the influence of nanoconfinement on the glass transition and associated kinetics, on melting and crystallization, and on polymerization kinetics and resulting properties. In this talk I will present recent results investigating the depression of the glass transition temperature for nanoconfined materials, including single polystyrene ultrathin films, glass-formers confined to nanopores, and glass-formers nanoconfined by crystalline domains. The results will be discussed in the context of the leading explanation for the T_g depression in nanoconfined glasses, i.e., that the mobility arises from free surface and interface affects.