Abstract Submitted
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Confinement Effect on Glass Transition of Thin Polymer on Nanoparticles[1] WEI CHEN, QI XUE, Nanjing University — A better understanding of the glass transition might come from the observation of key changes in the behavior of polymer when confined at the nanometer scale. We find that confinement has influences on both the affinity of the adsorbed polymer and its glass transition temperature (Tg) on nanoparticles. The dipolar filter proton solid state NMR signals of PMMA adsorbed on SiO2 nanoparticles indicated the multilayer of PMMA was more strongly confined, while the monolayer was less confined and had a higher mobility. The differential AC chip calorimeter studies on thin film of PMMA on flat surface shows little dependence of thickness of film on Tg, while PMMA thin layer on SiO2 nanoparticle was more mobile and has a lower Tg compared with the thick PMMA. These results indicated that the confinement plays an important role in the glass transition temperature of thin polymer film. This result established a link between the mobility detected by high resolution proton solid state NMR spectroscopic method and the glass transition measured by differential AC chip calorimeter.

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