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Direct evidence of enhanced surface mobility in molecular glass forming system 1,3-bis-(1-naphthyl)-5-(2-naphthyl)benzene CHAD DALEY, Dept. of Physics and Astronomy, University of Waterloo, DAN SCIFO, ZAHRA FAKHRAAI, MARK EDIGER, Department of Chemistry, University of Wisconsin-Madison, JAMES FORREST, Dept. of Physics and Astronomy, University of Waterloo — We have performed nanoparticle embedding studies on the organic glass forming system 1,3-bis-(1-naphthyl)-5-(2-naphthyl)benzene (TNB). Films are prepared by vapor deposition onto a Si substrate held at a temperature near T_g – 50K (T_g = 347K) and subsequently annealed. The surfaces of the films are covered with 20 nm diameter gold nanoparticles. Atomic force microscopy is used to track the apparent height of specific nanoparticles as a function of time elapsed at embedding temperatures of 323K, 333K, and 343K. The experiments reveal direct evidence for surface mobility at temperatures below the bulk glass transition. In addition to changes in the apparent heights of the nanoparticles, there is clear evidence that material surrounding the nanoparticles is being drawn up to engulf the nanoparticles; something not observed in polymeric films. These results directly establish the presence of enhanced surface mobility in molecular glass forming systems.

Chad Daley
University of Waterloo

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