Liquid-Like Behavior of Glassy Surfaces

Zahra Fakhraai
Assistant Professor,
Department of Chemistry
University of Pennsylvania

Recent studies have indicated that the relaxation times near the surface of organic glasses are orders of magnitude faster compared to bulk dynamics. Near the free surface of these glasses the dynamics lose many of the characteristics commonly associated with glasses. The dynamic properties lose their typical Vogel-Fulcher-Tammann (VFT) temperature dependence and take on Arrhenius temperature dependence.

We use direct and indirect measurement techniques to measure the relaxation times of the surface and the bulk, the diffusion coefficient at the free surface, the thickness of the free surface layer, and its penetration into the glassy film. Combined, these measurements allow us to understand how free surfaces mediate enhanced mobility and the correlation between the onset of this effect and the bulk glass transition temperature.