

Abstract Submitted  
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**Effective Viscosity of Ultraviolet Ozone Modified Polymer Nanometer Films.**<sup>1</sup> XUANJI YU, Materials Science and Engineering Division, Boston University, FEI CHEN, Department of Physics, Boston University, OPHELIA KC TSUI, Department of Physics, Hong Kong University of Science and Technology — Reductions in the glass transition temperature and effective viscosity have been reported for polystyrene (PS) films supported by silica upon thickness reduction. The most common attribute is enhanced mobility at the free surface. Here, we chemically modified the topmost region of the films by ultraviolet ozone (UVO) and measured their effective viscosity. We found that even with a brief UVO exposure of 1 second under typical exposure conditions, the reduction in effective viscosity was eliminated and for film thickness below about 15 nm effective viscosity exhibited a rapid increase with thickness reduction. A layer model, consisting of a viscous oxygenated surface layer topped with some median mobile species, atop a bulk-like layer, was able to fit the data well. Our result demonstrated the potential of UVO treatment to adjust the dynamic properties of polymer thin films.

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