

Abstract Submitted
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Time and Temperature Dependent Surface Stiffness of Poly(alpha-methylstyrene)(PAMS) through Particle Embedment¹ TASKIN KARIM, GREGORY MCKENNA, Texas Tech University — In the present work, we have used the particle embedment technique with sub-micron particles to study the time dependence surface modulus of poly(alpha-methylstyrene)(PAMS) at different temperature ranging from room temperature to $1.1T_g$ of PAMS. The surface was found softer at room temperature and at $1.02T_g$ compared to the bulk film while at $1.1T_g$ the surface was found stiffer compared to the macroscopic modulus measured for the same PAMS. The embedment of the particle is determined from atomic force microscope measurements and the modulus was determined using the elastic analysis of Johnson, Kendall and Roberts (JKR) with surface energy estimates of the work of adhesion as the driving force for embedment. REFERENCES 1. K. L. Johnson, K. Kendall and A. D. Roberts, *P. Royal Society of London A*, **324**,301-313 (1971). 2. J. H. Teichroeb and J. A. Forrest, *Physical Review Letter*, **91**,016104 (2003).

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