

291ad Nanoindentation Studies on Nanoscaled Polymeric Films

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Measurement of the mechanical properties of Nanoscaled polymer films is important for the fabrication and design of nanoscaled layered materials. Nanoindentation was used to study the viscoelastic deformation of nanoscaled polymeric films with thicknesses of 47 nm, 125 nm and 3000 nm. The reduced contact modulus increases with the indentation load and penetration depth due to the effect of substrate, which is quantitatively in agreement with an elastic contact model. The flow of the nanoscaled films subjected to constant indentation loads is shear-thinning and can be described by a linear relation between the indentation depth and time with the stress exponent being $1/2$.