

Abstract Submitted
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Effect of entanglement density on mechanical properties of glassy polymers¹ ROBERT HOY, Johns Hopkins University, MARK ROBBINS, Johns Hopkins University — The mechanical properties of model glassy polymers are studied using computer simulations. Using primitive path analysis, we relate the macroscopic stress-strain behavior of polymer glasses to the microscopic evolution of the underlying entanglement network. The network plays little role in phenomena such as the initial yield and strain softening, but dominates the mechanical response at larger strains. Comparison of results for systems with a wide range of entanglement densities allows study of the onset of network- dominated behavior. The density of entanglements is varied by changing the bending stiffness and diluting with shorter chains.

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