Role of Topological Constraints in Deformed Polymer Melts

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ABSTRACT

The plain fact that polymer chains cannot cross through each other introduces significant constraints and is of central importance, e.g. for polymer rheology where entanglements dominate the dynamics. Such constraints can be permanent, as for gels and networks or ring polymers or temporary but long lived as in polymer melts. By manipulating entanglements new non-equilibrium materials can be made. Currently there is no comprehensive analytic theory, which links topological constraints to material properties beyond the tube model and its extensions. The talk will report on recent studies of polymer melts of polymers way above the entanglement length. Both experiments and simulations point to interesting new materials.

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