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Force Induced Globule-to-Coil Transition of Single Polymer Chains.[1] NIKHIL GUNARI, University of Pittsburgh, GILBERT WALKER, University of Toronto — Force induced structural transitions of individual homopolymer chains have been studied in different solvent conditions using single molecule force spectroscopy. Single molecule mechanics in the "fly-fishing" mode showed a first-order like transition for polystyrene (PS) in water exhibiting a characteristic three regime force extension curve. In contrast, poly methylmethacrylate (PMMA) showed a characteristic saw-tooth pattern reminiscent of multidomain disassembly behavior similar to that seen in modular protein mechanics. The plateau force for PS and the saw-tooth pattern for PMMA disappear when measured in aqueous guanidine hydrochloride solution and in other non-solvents showing that the characteristic deformational behavior observed for the two polymers in water may be due to hydrophobic interactions .

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