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Interfacial Rheology of Glassy and Non – Glassy Polymer Monolayer at the air - water interface S. SRIVASTAVA, Indian Institute of Science, D. LEISKE, Stanford University, J.K. BASU, Indian Institute of Science, G. FULLER, Stanford University — Interfacial rheology is the study of the relationship between interfacial stress and the resultant deformation of the interface. We have used this technique to study the 2D rheology of two different polymers, Poly methylmetha acrylate, PMMA and Polyvinylacetate, PVAc, as a function of concentration and temperature. The measured polymers differs widely in their bulk Tg : PMMA (117C) and PVAc (30C). Our results suggest that there is transition from viscous to soft glassy like dynamics for PMMA monolayer above the cross - over concentration from semi - dilute to concentrated regime. In the glassy regime both the storage and the loss modulus of the monolayer becomes equal in magnitude and almost independent of the measured frequency. The PVAc monolayer remains viscous deep into the concentrated phase and at the lowest measured temperature. The transition from viscous to soft glassy dynamics for PMMA monolayer occurs at $\sim 43°$C. The cross over temperature is 75°C less than the bulk Tg of PMMA. Our results are consistent to the earlier observation of the reduction in the Tg of confined polymeric systems with respect to bulk value due to enhanced mobility of the polymer segments at the interfaces.

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