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Varying Properties of Polymers in Thin Films: The Influence of Solvent Quality on Dewetting ADAM RAEGEN, Freiburg Institute for Advanced Studies, Albert-Ludwigs-Universitaet and Albert-Ludwigs-Universitaet Physikalisches Institut, MITHUN CHOWDHURY, ALEXANDER SCHMATULLA, GUENTER REITER, Albert-Ludwigs-Universitaet Physikalisches Institut — The transition from a solution to a dry melt or glass is shown to have an impact on the behavior of polymeric samples. This transition may result in residual stresses arising from out-of-equilibrium chain conformations due to rapid solvent loss. These non-equilibrium conformations and resultant residual stresses, in turn, can give rise to changes in the viscoelastic properties and ageing behavior of the samples. We investigate the effect of sample preparation on the dewetting behavior of spincast thin polymer films from unfavorable substrates, paying particular attention to the quality of the solvent used to dissolve the polymer. By tuning the solvent quality, we can affect the macromolecular configurations and the extent that the polymer chains are out of equilibrium. We observed differences in ageing and relaxational behavior dependent upon solvent quality, thus sample preparation has a crucial influence on the properties of polymers in thin films.

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