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Solvent Swelling as a Means to Modify the Properties of Polymer Thin Films ANDREW CLOUGH, OPHELIA TSUI, Boston University, MITHUN CHOWDHURY, KAIWAN JAHANSHAHI, GUENTER REITER, Albert-Ludwigs-Universitaet Physikalisches Institut, Freiburg, Germany — It has been observed that sample preparation can influence certain properties of polymer films. In particular, spin-coating from solutions of different solvent qualities result in films with different chain conformations. We surmise that upon formation by spin-coating, the chain conformation of a film is still adjustable by means of solvent swelling, resulting in modifications to the amount of entanglement and free volume. Initial measurements of thermal expansion upon heating after swelling suggest that there is a difference between polystyrene films swelled with a good solvent and a Θ solvent. We have begun a more detailed investigation by studying the effect of swelling on the dewetting behaviors. Preliminary data indicates that the quality of the solvent affects both the dewetting hole size and aging rate of the film.

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