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Controlling Marangoni induced instabilities in spin-cast polymer films: How to prepare uniform films PAUL FOWLER, CÉLINE RUSCHER, Department of Physics & Astronomy and the Brockhouse Institute for Materials Research, McMaster University, Hamilton, ON, Canada, JAMES FORREST, Department of Physics & Astronomy and the Guelph-Waterloo Physics Institute, University of Waterloo, Waterloo, Canada, KARI DALNOKI-VERESS, Department of Physics & Astronomy and the Brockhouse Institute for Materials Research, McMaster University, Hamilton, ON, Canada — In both research and industrial settings spin coating is extensively used to prepare thin polymer films of reproducible thickness. Normally spin coating produces highly uniform films, however under certain conditions the spin coating process results in films with non-uniform surface morphologies. Although the spin coating process has been extensively studied, the origin of these morphologies is not fully understood and the formation of non-uniform spin-cast films remains a practical problem. Here we report on experiments indicating that the formation of surface instabilities during spin coating is dependent on temperature. Furthermore, we find that non-uniformities in the film thickness can be entirely avoided simply by changing the spin coating temperature.

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