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The swelling and dissolution kinetics of polymer thin films
ARINDAM KUNDAGRAMI, M. MUTHUKUMAR, Polymer Science & Engineering, University of Massachusetts, Amherst — We consider a theoretical analysis of the swelling and dissolution phenomena in polymer thin films. To determine the overall kinetics, we first consider the swelling process in a two-component system(solvent and polymer) and then apply this theory in conjunction with the theory of diffusive penetration of the solvent into the thin film. We also consider the dissolution of a pre-formed swelled gel of cross-linked polymers. Both analyses involve multiple moving boundaries. A comparison of our theoretical results with experimental data will be presented.

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