

Abstract Submitted
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Diffusion of adsorbed theta-solvent polymers at a solid-liquid interface CHANGQIAN YU, SUNG CHUL BAE, STEVE GRANICK, Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign, DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING, UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN TEAM — We study how surface diffusion depends on temperature when this is varied below the theta temperature. In the polystyrene-cyclohexane system, we use FRAP (fluorescence recovery after photobleaching) to measure over times over 4 orders of magnitude, from 10 sec to 10^5 seconds. A fast component of motion is attributed to chains loosely bound to the surface. A slower component of motion is retained after rinsing; it is subdiffusive. At temperatures below the bulk coexistence temperature, the surface layer is thicker than a monolayer. We show that bulk phase separation of polymers in dilute solution produces a dense surface layer of emulsion and foamy near-surface structure.

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