Large Deformation of Films from Soft-Core/Hard-Shell Hydrophobic Latices

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Received 13 March 2001; revised 25 October 2002; accepted 13 November 2002

ABSTRACT: Structured soft-core/hard-shell hydrophobic latices form rigid and transparent films under ambient conditions without the need of coalescing aids. The studied films have a composite structure, with the majority of soft poly(*n*-butyl acrylate) dispersed in a continuous poly(methyl methacrylate) (PMMA) matrix. The matrix is formed by thin latex shells brought into intimate contact by surface forces. Despite the weakness of the interfaces between adjacent shells, the films exhibit high yield stress and surprising ductility. These properties result from a very specific PMMA matrix structure built from PMMA ligaments with a thickness of a few nanometers. Under these conditions, PMMA appears to shear without damage.
J Polym Sci Part B: Polym Phys 41: 224–234, 2003
Keywords: structured latex films; mechanical properties; plastics; ductile