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**Molecular Interpretation of Polymer-Polymer Adhesion** SURIYAKALA RAMALINGAM, GUOLIN WU, SHAW L. HSU, Polymer Science and Engineering, University of Massachusetts, Amherst — Using the techniques developed in our laboratory, the miscibility behavior of various copolymers has been determined experimentally. In addition, these experimental studies were guided by molecular simulation studies. One example deals with blends of poly (vinylidene fluoride-hexafluoropropylene)(PVDF-HFP) copolymers and poly (butyl methacrylate) (PBMA). The interaction parameter ( $\chi$ ) of the binary systems was determined by composition analysis of the co-existing phases by spectroscopic techniques. Using  $\chi$ , a generalized Flory-Huggins theory for free energy of mixing has been used to predict the phase diagram of these binary blends. It was concluded from the phase diagram that binary blends with P (VDF-HFP) copolymer content more than 50% by weight are not compatible in solution. This can attributed to the fact that PBMA segment migration into P (VDF-HFP) riche phase is not favorable. Studies were also conducted with Raman microscopy. From further studies on the physical properties of the polymers in the blend, the molecular interpretation of the adhesion behavior of these polymers has been evaluated.

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