Theoretical Consideration of Polymer-Polymer Miscibility

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We extended the previous lattice model for polymer solution systems to binary polymer blend systems. Based on Müller's Monte-Carlo simulation data for symmetric system (r_1=32 and r_2=32), the energy of mixing is correlated as a function of temperature and composition using an empirical expression. In addition, we introduce new universal functions which reflect the characteristics of polymer-polymer miscibility behaviors. In associated blend systems, specific interactions between polymer segments are considered by using a secondary lattice. Using only one or two adjustable parameters, the proposed model satisfactory correlates the experimental data of real polymer blend systems with greater accuracy than those of other models.